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PUBLIC HEALTH IN AMERICA*

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I shall not easily find words to express my gratification at the distinguished honor that has been given to me of presiding over this assembly of the men who have so distinguished themselves in the fields where my own humble services have met with a more than adequate reward; but permit me to say, with all the emphasis I can give to my words, that, standing here under conditions that can never again recur, I am profoundly sensible of the highest distinction of my life.

I am well aware that I owe this place to the fact of my relations to the State Board of Health of Massachusetts, the first board created in this country with the general powers of a central authority in matters concerning the public health.

BOARDS OF HEALTH

So far as the forty-eight states which now compose this Union have enacted laws on sanitary matters, they have framed health codes differing somewhat in details and adapted to the requirements of the people in each state, but agreeing in this: that they have dealt with the whole vast subject of the protection of the public health among their own inhabitants.

The boards of health created in these states have had essentially the same history; they have begun their existence with advisory powers, and have been entrusted in the course of years with executive functions more or less extensive. In some instances they have charge of the vital statistics; in other cases this most essential support of any comprehensive system of public hygiene is in a separate department.

The activities of these boards, except in some limited fields, are not so closely connected with the every-day wants of the people as are the municipal authorities.

It may be said that the tendency on this side of the Atlantic, in this branch of government as, indeed, in our political affairs in general, has been to bring the real power as near as possible to the people. For this reason, in my own state certainly, the most powerful organization for health purposes is in the hands of the local boards of health. While these are not always the best agents for the purpose, at present, they are worth all the trouble the state may take in the way of advice, instruction and assistance, because their efforts will lead more promptly and with greater satisfaction to the education of the whole people in reasonable sanitary administration than any other means now available. It is on this education of the population as a whole that all measures for the sanitary protection of the community must finally rest.

A police system which shall regulate all the doings of a person who happens to be a source of danger to his fellows is inconceivable, in this country at least, and certainly not to be desired, if any other means of relief can be found.

In some of our states provision is made for an appeal from the action of the local authorities to the state boards. In the majority, however, this appeal is of a very limited character.

Our guests may find it difficult to understand the peculiar relations of the states to each other and to the government at Washington, if they do not remember that the original states are older than the Constitution of 1787, and had had many generations of self-government before the formation of the Union. They were inhabited by men largely of English origin, tenacious of their rights, and accustomed to settle their public affairs in open meetings. They entered the federal Union with more or less misgivings as to the rights which they might be compelled to surrender for the purpose of securing the undoubted benefits that belong to a national government. They therefore retained every function which was not specifically transferred to the central authority. In 1787, the date of the formation of the Constitution, public hygiene cannot be said to have had an existence. Obvious nuisances were dealt with in haphazard fashion, and when quarantines were established they were usually futile, ill-conceived and needlessly oppressive. Generations were to come and disappear before the sure foundations were reached on which the modern structure of preventive medicine could be built.

RISE OF PREVENTIVE MEDICINE

Enlightened men in several countries had indeed taught some of the practices which protected the health of restricted groups of men, but for the community there was no relief. Rich and poor suffered alike, with the difference, however, that the wealthy paid from their abundance and the poor from their poverty and with their bodies.

In the eighteenth century preventive medicine had already reached a stage of development in Great Britain which placed that country in the lead of the world. It is only necessary to mention the names of Dr. Richard Mead, who in 1720 published his treatise on "Pestilential Contagion and the Methods to be Used to Prevent It"; of Sir John Pringle, who wrote on "Diseases of the Army," and of Dr. James Lind, who wrote an admirable treatise on "The Means of Preserving the Health of Seamen," which pointed the way to the practical eradication of scurvy from the British navy. Lind also

* President's Address before the Fifteenth International Congress on Hygiene and Demography, Washington, D. C., Sept. 23-28, 1912.

advised a treatment of typhus on which modern practice has made but little improvement.

From the labors of such men as these came a better practice, with results which in turn served as the most persuasive of teachings. The achievements of the century reached their highest point in 1798 in Jenner's discovery of vaccination, the greatest redemption from disease the world has known. Yet side by side with these memorable additions to the world's knowledge of the means of preserving health, views were prevalent as to the origin of epidemic diseases, hypothetical in kind and of such nature as to preclude the possibility of any control of contagion.

LACK OF ADEQUATE LEGISLATION

In the entire absence of any positive evidence as to the real nature of the more important diseases — or as to means for the prevention of pestilence — it was not unnatural that the framers of the Constitution of 1787 should not have included in the provisions of that document some reference to measures for the preservation of the public health. The strict constructionists of that instrument have held that the power of the United States to enact laws for the sanitary control of the country was to be found only in that clause which authorizes the United States "to regulate commerce with foreign nations and among the several states." On this slender thread was to hang our public health service.

The census authorized by the Constitution was for the purpose merely of counting the inhabitants. Lawmakers have been persuaded by public opinion to give a scope to the census approaching that of other civilized lands, so that in time there will be a sufficient body of vital statistics to enable us to determine some of the many questions which our unparalleled mixture of races offers. Our experience has already shown in limited areas great variations among the different stocks in resistance to disease, fecundity and longevity.

It is also true that it was found possible to attach to the Marine-Hospital Service in the Treasury Department some of the functions of a national board of health and this organization has performed its difficult task with conspicuous ability. Its able officers have always been subject, however, to the control of the Treasury Department, and that branch of the government is always more likely to be indulgent to the great business interests of the country than attentive to the suggestions of the trained sanitarian. Nevertheless I am not willing to admit that a due regard to the well-being of the whole community involves of necessity in any case a real injury to legitimate business. The suppression of the truth with regard to the existence of a pestilence in some of our cities has inevitably brought in the end such feelings of distrust on the part of those who have been too credulous, that they will be reluctant to yield hereafter to any evidence, however complete.

The various political parties have invited the attention of the voters of the country to the political platforms in which are set forth their respective policies. The declarations on the subject of the public health ought to satisfy the most ardent advocate of that cause. Therefore there is hope that our legislative bodies may find some way for bringing together the various sanitary functions now exercised by different departments of the government at Washington, and make them into a dignified and independent whole under a title which may signify that the preservation of the public health is no less the business of a federal republic than it has been of the various monarchies of the world. A bill to accomplish this purpose is now awaiting action in Congress. It was introduced by Senator Owen of Oklahoma and has the hearty approval of the health organizations of the respective states and of all who have an intelligent and honest interest in measures for the protection of the public health. It meets the opposition of the very few who still believe that such legislation lies beyond the powers of Congress, but its more important enemies are to be found among the selfish interests which fear diminutions of profit in the various enterprises which seek the cover of darkness. Those interests employ able attorneys and make much outcry about interference with the personal freedom of the citizen, although no provisions of this wise act can be construed to have this effect.

STATE AND FEDERAL SANITARY ADVANCEMENT

We present to you, our friends from other lands, the interesting spectacle of a successful democracy with, at heart, very conservative tendencies. We enter on almost interminable discussions on subjects of legislation and are apt to delay until an impatient public opinion forces the legislation to a conclusion. Our safety lies in the fact that our people have become educated in the matter under debate, at least, as early as our lawmakers. Our states and municipalities have therefore a more extensive, more connected and more instructive story of sanitary advancement than has the general government.

The establishment in England of a system of vital statistics in 1837 was followed by Massachusetts in 1842. The improvement in the sanitary condition of cities, which the epidemics of cholera forced on the Old World, were for the same reason made here. In the absence of a sufficient knowledge of the causative agent, the measures everywhere pursued were uncertain and to some extent ineffective; but a better conception of the value of pure water-supplies and more efficient systems of sewerage resulted from the stern teachings of this pestilence.

One name stands out above all others in the sanitary awakening of England, that of Edwin Chadwick. It would be a work of supererogation to tell this audience of his life work. Although his name always deserves honor, I mention it for the purpose of naming Lemuel Shattuck of Massachusetts, who submitted in 1850 to the legislature of that state a scheme for state medicine so far-reaching that it had to wait nearly twenty years for its adoption, and more than fifty years for its completion. Shattuck was inspired by the work of Chadwick and was more fortunate than his master in that his structure still endures. It would be out of place to describe more fully the work of the State Board of Health of Massachusetts. Starting earlier in the race than its fellows, it has watched without envy the approach of its competitors, and has gladly adopted when possible their procedures.

While it is true that the largest powers in the control of communicable diseases are lodged with the respective states and must necessarily be vested in them, it is also true that the general government has accomplished more in the scientific investigation of the causes of disease and has been of assistance to states and communities unable or unwilling to carry out all the measures requisite for the protection of their neighbors or even of themselves. The examples which have been given by the various services at Washington of invaluable work in the study of disease are well known to you. In the multitude of workers the world is apt to name only those who made the actual discovery, forgetting that many of the patient searchers have contributed much by indicating where the treasure was not to be found.

PREVENTING THE SPREAD OF COMMUNICABLE DISEASES

This continent has borne beyond the lot of civilized countries on the other side of the ocean the burden of yellow fever, which has brought in its train a greater panic fear and a wider dissolution of society and public affairs than any other pestilence. The mysteries of its progress led intelligent men to look to the great disturbances of nature for a cause. It had more than once invaded a city as far north as Boston and scattered its inhabitants in terrified confusion. Within our own time it had, for a brief period, rendered inaccessible the government of a great state. No effort had been spared in the attempt to obtain a knowledge of the real nature of the disease or some empirical means of preventing its spread. The brutal force of an unscientific quarantine had been our solitary guard. Competent medical men had been detailed from the services at Washington to study the disease in its home on the shores of the Caribbean Sea. They brought home proof of what it was not. Finley of Havana had suggested that the mosquito might be the vehicle for the infection. His brilliant hint had not been followed by convincing experiment. Walter Reed and his associates carried on in Cuba the investigations which finally established the absolute dependence of the disease on the agency of a mosquito, and yellow fever has ceased to be a plague, except in a community too indolent to make a proper use of a piece of mosquito-netting and to take active measures for the removal of the breeding-places of the insect. One last conquest remains — the isolation and the exhibition of the agent transmitted.

Another instance of successful dealing with a formidable menace to the public health has been the treatment by the Public Health Service of the bubonic plague on our western shore. Selfish commercial interests prevented the seasonable announcement of the presence of the plague in San Francisco, and caused unnecessary delay in the work of investigation and control. One important observation has been the extension of the disease to animals not hitherto shown to be generally infected, so that it can now be understood why the disease may remain concealed for a time and then break forth when least expected. We do not know, however, why an easily communicable disease should make its appearance on these shores for the first time, or why England should again be visited by it after the lapse of two and a half centuries. Again, this disease is not likely to be restrained by state boundaries, for whatever may be our means for restraining the movements of man, the rat and the squirrel do not recognize state lines, and nothing less than the authority of the nation can act with sufficient promptness to secure the best results.

With the presence of the disease in Porto Rico and Cuba the danger is imminent for the ports in close connection with those islands, and consideration of this peril may well engage the attention of this Congress.

Since the acquisition of the Sandwich Islands we have found ourselves face to face with the problem of leprosy on a large scale. This most ancient of named diseases, in earlier medical history probably a mixture of many diseases, has dominated the imagination of men through all times; it has been the exemplar of all that was dreadful in the afflictions of man; it bore the brand of a curse from on high. There is no sufficient proof that cases of the disease are more frequent here than they have been in the past, but in consequence of Hansen's discovery we have obtained the possibility of a definite diagnosis and can now speak with measurable accuracy of the number of cases existing in any community. At the beginning of the year 1912, 146 cases of the disease were known to exist in the United States. These were cared for with varying degrees of precaution by the authorities of seventeen states. Three states only, California, Louisiana and Massachusetts, have established isolation hospitals to which lepers must be removed and segregated. In the great majority of cases in this country leprosy has been an imported disease; and fortunately in portions of the Northwest, where infected individuals from Scandinavian countries brought the disease many years since, there has been no increased prevalence of leprosy, but on the contrary an apparent disappearance. Great changes in habits of living have probably exercised a helpful influence in bringing this result to pass.

If we are to insist on rigid isolation, these patients could be taken care of much better in some central station under favorable climatic conditions and under the supervision of the national authorities. It is proper that the federal government should undertake this responsibility because the victims of this disease are, in the main, importations for which no one state should bear the burden.

At the Leprosy Investigation Station in Hawaii, the successful cultivation of the lepra bacillus on artificial mediums has been accomplished. Monkeys have been inoculated and important additions to our knowledge may be confidently expected.

We congratulate ourselves on the freedom of the country from outbreaks of cholera, notwithstanding the fact that 25,000 out of the 237,000 immigrants landing last year at the ports of Boston, New York, Philadelphia, Providence and Baltimore came immediately from cholera-infected countries. In the search for carriers of the disease at the port of New York over 23,000 bacteriologic examinations are reported, with the result that the vibrio of cholera was found in twenty-eight persons having the disease and in twenty-seven persons who appeared to be in good health. The Italian government has aided this country by its measures to secure favorable sanitary conditions on board vessels conveying emigrants. The royal commissioners, who are officers in the naval medical service, are attached to these vessels and have very extensive powers in the management of the passengers in all matters concerning their health. It has been officially stated that the aid rendered the quarantine service by the royal commissioners has been of a very high order. Another important measure of cooperation has thus been undertaken which illustrates the newer spirit which the Paris convention of 1903 and the Washington Convention of 1907 have brought into the administration of quarantine. The experience of the past year is memorable, because for the first time in our own quarantine history, and anywhere on such a scale, the principle of the enforcement has been that any suspected person who is shown by laboratory examination to be free from the possibility of conveying infection may be admitted to the country.

THE PANAMA CANAL

To many here the construction of the Panama Canal may seem to be the most important of our sanitary achievements. The United States, taking advantage of its Cuban experiences in dealing with tropical diseases, and employing the same skilled agents on the newly acquired property in the canal, has carried the work so rapidly toward its finish that we may well hope that the present chief magistrate may see in his present term of office

the virtual completion of the task. He had a controlling influence in determining the form of the canal while secretary of war, and has been an active and much interested and wise helper in every stage of its progress.

The French engineers who began the work, and who had labored energetically and skilfully on it, had nothing to learn from others in their own department, but it became impossible to maintain efficient organizations under the circumstances which then existed. The mortality and morbidity rates from malaria and yellow fever previous to 1904 would sooner or later have brought the work to a standstill.

Colonel Gorgas, to whose immediate supervision the sanitary work was entrusted, has made an interesting comparison of the vital statistics of the population of the Canal Zone with a well-regulated city in a Northern state containing nearly the same number of inhabitants. The rates do not differ essentially in the two communities. Whether the example thus offered to the countries in the neighborhood of the canal will be followed may be a question, but it seems to have been shown that it can be followed and at an expense not of itself prohibitive.

PROBLEMS IN PUBLIC HEALTH WORK

The International Congress of Tuberculosis held in this city in 1908 was a powerful stimulant to our people in promoting measures for limiting the spread of this disease. The interest in such measures is world-wide. Trustworthy statistics show that the successes obtained are commensurate with the efforts put forth. The relations of the state or municipality to the patient who may be treated at the expense of the public are not yet satisfactorily settled and there are other difficulties in the situation so serious and so complex that we ask for the benefit of the wise counsels of this body of experts.

Pellagra, which has long been looked on as a disease of Southern Europe, has recently been recognized in portions of this country. The problems of the disease are attended by so many difficulties and uncertainties that we have not yet been able to come to satisfactory conclusions with regard to it. Hospitals and asylums for the insane, with their wrecks of humanity, have been the places where the disease has been most closely observed, with the obvious difficulties of obtaining sufficiently correct histories of the early stages of the disease. Whether maize in a damaged state is the important factor in producing the disease can hardly yet be asserted. Taking into consideration the vast importance of Indian corn as a food product in this country, we earnestly invite your aid in the discussion of this question.

The venereal diseases are ever perplexing subjects for state control; our various experiments in this direction will be brought to your attention. It is too early to claim results of much value, but hardly any one disease is of so much importance to the public welfare as this, and the time is long since past for neglect and silence concerning it. Visitors from this country to that unequaled display offered to the world at the great Dresden exposition were much impressed by the completeness of the information presented by the department of sexual hygiene, and brought home ideas that cannot fail to have an influence here.

Epidemic cerebrospinal meningitis has been one of the diseases thoroughly studied at the Rockefeller Institute in New York, with the resulting discovery of an antidote serum; the epidemic form of this disease has become amenable to treatment through intraspinal injections of the serum. This success is full of encouragement for the efforts being made to discover a serum treatment of infantile paralysis which has appeared in recent years in all parts of the country and has been here as elsewhere an intractable disease not yielding to any medical treatment, and mysterious as to its cause and means of extension.

The importance of milk as a food has caused much legislation for the purpose of improving the quality of the article offered for sale. The difficulty of regulating the traffic between neighboring states has had something to do with the present unsatisfactory conditions. Certain traditional forms of uncleanliness have accompanied the dairyman's occupation for generations, and an attempt to change them has been so generally resented by the producer that improvement has moved slowly. There has been a change for the better, however, in the milk-supply of the large cities. But in this instance again affluence pays with that which it can easily afford, but poverty pays with its life. The grievous burden of excessive infant mortality, especially among the poor and careless, would undoubtedly be much diminished by a better-guarded milk-supply.

The reduction of infant mortality is one of the most important branches of public health work now before us. Unfortunately our infant mortality rates are not in general of a character which make possible the minute analysis which such tables possess in many of the countries from which you come. Some cities, however, possess statistics accurate enough to enable competent observers to draw conclusions which show results of an encouraging character.

I have enumerated some of the diseases that must fall under the notice of the public authorities. There are others to which I might well give a place, but they will receive due attention in some of the sections of the Congress.

ADVANCE IN MEDICAL RESEARCH

There has been no period in the history of the world, when wealth has been so sensible of its duties as in this. Whether we may assert that the long practice of democracy in the United States is responsible for this condition or not I may not venture to say, but our men of great wealth have given of their abundance generously and wisely, and there is no more encouraging sign of the times than the earnestness with which wealthy citizens have applied themselves to the relief of conditions which are elsewhere matters of government care. While it may seem ungracious to speak of a few evidences of this spirit, it would be ungenerous not to mention those great benefactions which are closely connected with the purposes to which we have devoted ourselves.

First of these great foundations is the Rockefeller Institute for Medical Research, created for the purpose of conducting, assisting and encouraging investigations in the sciences and arts of hygiene, medicine and surgery and allied subjects, in the nature and causes of disease and the methods of its prevention and treatment, and to make knowledge relating to these various subjects available for the protection of the health of the public and the improved treatment of disease and injury. The institute possesses in a suitable location in the city of New York a laboratory building and a hospital with a capacity of about seventy beds. Laboratory and hospital constitute as far as possible a unit. The scientific results obtained by this institution in the study and treatment of diseases which may be reckoned among the chief scourges of mankind are well known to you. The endowment funds amount to many millions. All this

represents the enlightened public spirit of one wise and generous citizen. In order to relieve conditions resulting from the general prevalence through our Southern states of hookworm disease, Mr. Rockefeller has given $1,000,000 for immediate use in its treatment. Under the charge of the very capable commission charged with the expenditure of this money much human incapacity has been removed, and valuable lessons have been taught in the elements of personal hygiene. Great as these gifts are, still larger funds have been set aside by Mr. Rockefeller, most sagacious in his charities for the improvement of the condition of his fellows in many directions.

Other notable foundations for the promotion of the public health are the Memorial Institute for Infectious Diseases in Chicago, and the Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis in Philadelphia. The list might be enlarged by many other names of men and women who have given freely for the same unselfish purposes.

PUBLIC WORKS

Domestic water-supplies and systems of sewage-disposal have received everywhere in the country in recent years much attention. The examples of our practice and the results of our investigations in these subjects have a well-recognized value. The Lawrence Experiment Station of the Massachusetts State Board of Health for the study of the process of sewage-disposal has been for many years an authority of high rank, and its publications have had a wide circulation. Many of our large cities are situated on the shores of the ocean or on great lakes and rivers, and the easy method of disposal of sewage has been its discharge into these waters. The ocean will probably continue to receive all that can economically be brought to it without too great offense to the senses, but it is already evident that the large streams and lakes must be protected against increased pollution.

Our extravagant demands on the public water-supplies have been met by constructions that challenge comparisons with the monumental works of the Roman world.

INADEQUATE STATISTICS

The discoveries in the astronomical observatory have no more certain application to navigation, nor chemical research to manufacture, than have the statistics of life and disease to the protection of the human race. As a whole this country can take little credit to itself in the registration of vital statistics. The registration area as regards deaths includes less than 57 per cent. of the total population of the Union.

The public health officer should be able to call on some responsible department of government for sufficient statistical data to enable him to recognize the unnecessary and preventable wastes of life in any given district. His conclusions would be justified only on the assumption that the data are accurate and that the calculations of the various observers are so similar in character as to be safely comparable.

Since the permanent establishment of the United States Census Bureau, that office has done much to promote registration and to secure uniformity in its methods. A model bill has been drafted by the office in consultation with the authorities of the states, public health and medical associations and persons competent to advise in the matter, and trustworthy data should soon be obtained from the whole country instead of from only a few of the Northern states.

PREVENTION OF OCCUPATIONAL DISEASES

The hygiene of occupations is within the control of the separate states and only indirectly subject to national legislation. The British factory act of 1802 to protect the health and morals of apprentices and other employees in cotton and other mills—the beginning of England's great code of industrial legislation—was not followed in this country for a generation or more, and then first in Massachusetts.

Manufactures have been so largely the occupation of the inhabitants of this state that the legislation probably comprises as complete a body of statutes and sanitary regulation as can be found in the country.

This legislation has undoubtedly been highly beneficial to the workers in mills and factories, and so far as the conditions within the factory buildings are concerned has promoted health; though it is true that the workman sometimes goes from the carefully guarded surroundings of his workplace to the less favorable conditions of his own tenement.

There are still industries, however, which have not yet removed all the conditions inconsistent with health, and in which employers and workmen are alike unwilling to submit to unusual precautions for the purpose of avoiding personal injury or possible impairment of health. The legislation in several states appears to have reached a point where it may be asserted that this stage has passed and that we should now bend all our efforts to a course of determined and persistent administration in the hands of instructed and public-spirited officers acting with all the great powers conferred by existing statutes.

INSPIRATION FROM GREAT ACHIEVEMENTS

On occasions such as this we must feel the silent influence of the great men who have labored in the cause which we are met here still further to advance. They gave us the knowledge which has made it possible to deal with a few of the problems that have perplexed the world. Can any intelligent man believe that we have reached the goal? There has never been a time when the religion of mutual helpfulness has had such sway as now, nor has there been a time when the means of accomplishing its great purposes have been so ample.

The names of Jenner, Pasteur and Koch should be present in the minds of the members of a congress such as this. They contributed in the highest degree to the development of preventive medicine. Jenner discovered vaccination and, wise beyond his time, hinted that the vaccine vesicle was nothing but a modified small-pox and that in future some similar modification of the plague even might be obtained. Pasteur in his laboratory wrought to a scientific certainty the facts which prove the doctrine of infection, and the modification of the infective elements of disease. Koch devised new methods for studying microorganisms, and added to the list of the known producers of disease the bacilli of tuberculosis and Asiatic cholera.

The living holders of the torch I need not name. Some are present here, and we shall all gladly greet them; some, though absent in body, are represented by their teachings and their works, and to these we shall do honor. What happier fortune can befall a man than to labor as these men have striven; their aims have been the highest and their reward the most worthy. Fortune has given to them nothing greater than the power, and their nature nothing better than the wish to serve their fellow men.

In conclusion it now becomes my duty to welcome in the name of the American members of this congress our associates who have journeyed, many of them so far, to join us in these meetings. Very few of you are strangers to us, at least in name, and we anticipate with pleasure the formation of that personal acquaintance which adds so much to the value of such gatherings as this. All our interests are the same; in our pursuits there are no limits as to monarchies or republics; thrice welcome to the United States.

MEDICAL PROGRESS*

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I invite you to take with me a reflective glance over the general intellectual movement which has led up to our latter-day modern medicine.

We hear much of the progress and of the science of medicine. It is impressed on us in our daily work, in meetings with fellow practitioners, in medical journals and in conversation with patrons and friends. The wonders of modern medicine are exploited by the magazines and in the daily press. It is a matter of common knowledge that medicine has entered on a new era, more scientific and exact, and more efficient in the relief of suffering and in the prevention and cure of disease.

If we review the general field of medicine or any of the departments into which it is divided, we are impressed with the fact that our knowledge of the human body with all its complexities of structure, function and variations in disease has been enormously increased. By the assistance of the allied sciences, which Dr. Welch has so graciously acknowledged, especially physics, chemistry and biology, aided by improved methods of investigation and instruments of precision, new facts have been discovered and many of Nature's important and well-guarded secrets have been laid bare. The new principles evolved have been put to the test and their application in practice has been followed by the most brilliant successes in the annals of medicine.

In the great scientific developments of the latter half of the nineteenth century, medicine shared generously. It has advanced with rapid strides toward a truly scientific basis and in its progress it is discarding more and more of the empirical methods which formerly characterized it. Medicine has undergone a veritable revolution within the span of a generation and to-day is taking high rank as a science and speaking with a new authority supported by demonstrable facts.

THE RENAISSANCE OF SCIENCE

Knowledge of the natural world had been slowly and laboriously broadened and increased during the sixteenth and seventeenth centuries, and after a period of speculation there was a general reawakening of interest in the sciences toward the end of the eighteenth century. Chemistry, physics, natural history, mathematics, all felt the influence of the revival. The spirit of investigation extended rapidly in all sciences, and from Paris, the most active center of scientific study, it spread and became intensified as the nineteenth century advanced. Facts such as had caused Bacon to ask *cui bono?* were developed, and although they appeared to have little or no practical application, yet they clashed with the existing systems of thought and disturbed them as had the scientific discoveries of earlier centuries. Their announcement was received with indifference if not with active opposition. The discoveries were, however, important and convincing and could not be ignored. They excited more and more interest; efforts were made to put them to practical use, and their champions were more insistently and successfully demanding a fair hearing withheld by prejudice. New methods were being introduced, knowledge increased and the realism created by a more active nature study caused a gradual shifting in the trend of thought from the metaphysical to a more practical vein. The reciprocal relations between the sciences were more definitely appreciated and the conception of the unity of all knowledge was impressing itself more prominently on the intellectual world. Man's mind was being rapidly opened for the reception of new truths and the belief was becoming more general that alongside the world with which he had been familiar, Nature held secrets of value to man which it was incumbent on him to investigate untrammeled by preconceived opinions. The tendency to independent thought was increasing and the spirit of science was becoming more and more restive and resentful of the hide-bound restrictions exercised by philosophies and theologic dogmas which had long held scientific investigations in check. Pasteur in saying that "science should not concern itself in any way with the philosophic consequences of its discoveries" well expressed the spirit of advance and foreshadowed the coming break with the old philosophies which was to mark the final independence of all science.

The substitution of the doctrine of evolution, in geology by Lyell for that of cataclysms, and in the organic world by Darwin for that of special creations, shed an effulgent light on the processes of Nature. It gave man a more comprehensive view of the universe, of the planet we inhabit, of natural law and particularly of the orderly, harmonious progression pervading the inorganic and organic worlds. It broadened and strengthened him and enlarged his intellectual outlook. The doctrine of evolution came as the culmination of the developments in science during the first half of the nineteenth century and was destined finally to shake to their foundations man's most cherished beliefs in the old order. After a period of loud, contemptuous and angry protest the older systems of thought capitulated and henceforth the pathway of science became easier, and the barriers to the unprejudiced reception and examination of new discoveries were to a large extent broken down. The science of biology thereby received a new impetus and the further development of medicine was especially favored. Huxley in speaking of science in general nominates evolution as one of the three great doctrines to which the greater scientific achievements of the nineteenth century may be ascribed.

It is said that all natural sciences pass through three stages in their development; first, the descriptive, during which facts are observed, collected and classified; second, the analytic, during which the problems are being examined, resolved and reduced to principles; and, third, the synthetic, the constructive period when, methods of production being known, phenomena may be reproduced and interpreted from different points of view.

THE DESCRIPTIVE METHOD OF PRIMITIVE MEDICINE

From the earliest times in Greece physicians were held in high esteem and Homer said that "a physician outweighs many other men." Throughout history physicians have been leaders in the thought and science of

* President's Address before the Colorado State Medical Society at the Annual Meeting, held at Pueblo, Sept. 24-26, 1912.

their time and have laid up stores of precious knowledge for which the world must ever remain a debtor; yet when we apply our formula we must appreciate that speculation and theory based on observation alone did little toward the advancement of medicine as a science but rather encouraged it during its developmental stage. For centuries superstition, tradition and dogma reigned and exercised an absolute sway over the minds of men. All efforts for innovation were subjects of amusement, ridicule and contempt, and were often harshly suppressed. All Nature — and especially the human being — was mysterious and held in awe as too sacred for inquiry except on theoretic lines, and these must not overstep certain bounds. Authority and tradition formed the supreme court from which there is no appeal. Even during the sixteenth and early part of the seventeenth century, after a scientific spirit had broken forth in connection with the physical sciences, the cry of physicians, "back to Hippocrates," was insistent.

It is toward the end of the eighteenth century that dissatisfaction with the view that the symptoms were the disease became more manifest. It is then, in the independent efforts of Auenbrugger, Bichat, Corvisart, Laennec, the Paris school of pathologic anatomy and diagnosis, and later of Louis to find the explanation of disease in the anatomic lesion rather than in its clinical manifestations and by new methods of examination correlate the two, that we note the awakening of a true scientific spirit in medicine. Having its inception coincident with the rapid development in sister sciences favored by the general movement already mentioned, this spirit in medicine has since persisted against all opposition and grown steadily to its present proportions. This careful study of morbid anatomy following more critical physical examinations, by percussion and auscultation, so richly rewarded these men in France that it was enthusiastically continued by their followers and later adopted in Germany. Biology and pathology were established as sciences and physical examination as an efficient aid to diagnosis was recognized as a method of value to be systematically adopted.

DEVELOPMENT OF MEDICINE BY ANALYSIS

The introduction of this analytic method of inquiry marks for us the passage from the first to the second stage of the development of medicine.

From this time important additions were made laying broad and sure foundations for the further development of medicine later in the nineteenth century. Physiology was first to feel the impress of the new scientific spirit and much progress was made by the work of Magendie, Bell, Müller, the Webers, Claude Bernard and others. Studies in comparative anatomy and physiology were more actively pursued. Facts were being accumulated in gross pathology, but its material advancement awaited the development of the compound microscope in the fourth decade, by means of which Schleiden and Schwann were able to determine that the cell was the unit of plant and animal structure and to announce the "cell theory." This discovery revolutionized morphology and permitted rapid developments in histology and embryology. About twenty years later Virchow formulated on it his doctrine of "cellular pathology" which was destined to form the basis of all future work in pathology. In the meantime Liebig at Giessen was developing the new science of that organic chemistry which was the forerunner of physiologic and the biologic chemistry of to-day. Medicine, though long called the "mother of all sciences," apparently still failed to appreciate its dependence on other sciences. Even the growing close connection with physiology was cause for comment, and in 1859 Claude Bernard felt called on to defend physiology against the sneer that it was a "science *de luxe*" and of no practical use to medicine.

Aristotle observed that "wonderment arises from the ignorance of the causes of things." It is doubtless because of this attitude of the human mind that disease throughout all history had been enshrouded in mystery since observation, theory and the wreckage of the dead-house had yielded no explanation of its causation, but only its dire results. Many theories had been propounded, but as they rested on no demonstrable basis they were supplanted one by one and medicine was unable to make any material advancement so long as physicians had no satisfactory explanation of the causative factors of symptoms and lesions. Kircher and Leeuwenhoek had discovered microorganisms and the latter had classified and described them. Shortly after and toward the end of the seventeenth century Robert Boyle had said: "He that thoroughly understands the nature of ferments and fermentation shall probably be much better able than he that ignores them to give a fair account of divers phenomena of several diseases (as well fevers as others), which will perhaps be never properly understood without an insight into the doctrine of fermentations." Marcus Plenciz, about 1762, had contended that infectious diseases were due to microorganisms, which alone had the power of conveying infection, and that there were specific organisms for each disease. Our own Holmes and later Semmelweis asserted that puerperal fever was due to putrid material introduced from without. Schönlein, in 1839, discovered the parasite of favus, and in 1849 Pollender noticed the anthrax bacillus in the blood of dead animals, but it was not until 1863 that Davaine showed its causative relation by inoculation of animals. Otherwise the experimental method had not been applied in etiology, corroborative proofs were lacking, no practical inferences were drawn from these assertions and the origin and nature of disease remained in profound obscurity.

Louis Pasteur, thoroughly impressed with the suggestive value of Boyle's statement, and with the ambition to explain the causes of putrid and contagious diseases, entered on his experiments in fermentation; and in 1863, by his brilliant and conclusive results, established an epoch-making principle and furnished the first reliable data on which the germ theory of disease is based. Later applying it he demonstrated that certain diseases of animals and of man were caused by bacteria. The veil of mystery surrounding the etiology of infectious diseases was thus finally removed and the clear scientific light shed on the nature of these diseases opened the way for the various developments which are responsible for our present views of disease and on which our modern medicine rests.

Louis Pasteur pointed out the road, Robert Koch devised the method of solving etiologic problems and medicine passed from the second to the third stage of development.

THE SYNTHETIC STAGE OF DEVELOPMENT

From the earliest time of which we have historic record physicians had relied almost exclusively on bedside studies for their knowledge of disease, and all progress in medicine had resulted from deductions made from clinical observations, supplemented especially during the nineteenth century by more detailed pathologic investigations and a few chemical analyses.

Experimental methods had been responsible for all our knowledge of physiology and they had been the fruitful source of progress in all other sciences. The highly complex character of living creatures in structure and in function had, however, rendered experiment in medicine difficult and retarded its application, and though it had been used to some extent in pathology, only isolated facts had been ascertained and its results were limited. With the methods of Koch, guided by his "postulates," aided by the stains introduced by Weigert and improvements in the microscope, experiments on animals were now freely resorted to for the solution of etiologic problems and became exceedingly fruitful in results. The discovery of the causative factor of one infectious disease after another was announced and the attention of the medical world was arrested by the exact findings of the laboratories and the success following their application in practice. The superiority of the experimental over the clinical method for the study of disease became at once apparent, laboratories for medical research sprang up in all scientific centers, and an increasing number of medical men devoted their exclusive energies to the study of the pure science of medicine. The economic value of this work being recognized, medical research was subsidized by governments, universities and private foundations. Such laboratories became better organized, their work was more carefully correlated, reported and checked, and from them has emanated the new information on which all subsequent progress has been based. Osler remarks that the experimental method did more to emancipate medicine from routine and the thraldom of tradition than all the work from Hippocrates to Jenner.

Favored by the discovery of anesthetics, surgery first felt the influence of Pasteur's teachings. From the successes of Lister, who first adopted and applied them, has developed the perfected technic which has permitted the great expansion of this branch of the healing art. By its application the innermost recesses of the human body are to-day entered with comparative safety, the actual disease examined, and in many cases a far more efficient remedy applied than ever before available. Diseases heretofore not accessible during life are studied *in situ* in their early stages, and medicine avails herself of the surgeon's findings to perfect her knowledge in pathology, diagnosis and treatment. Surgical interference with certain tissues, ovaries, thyroids, parathyroids, etc., has contributed greatly to our present knowledge of the so-called internal secretions.

Advances in medicine came from determining the causative factors of many diseases, the reactions between the invading organism and its host, and the further knowledge of the cell and its activities. The first and great profits of these developments accrued to preventive medicine and in lesser degree to medicine in general. Methods of prevention at once became more specific and exact and preventive medicine has already grown to enormous proportions and achieved most brilliant results. For a long time it appeared that the inability to reach the invader without damage to the host would be an insuperable obstacle to a more direct and efficient treatment. Following the discovery of the specific germs causing disease came the knowledge of attenuated virus effective in the prevention of rabies; the bactericidal properties of blood-serum; the toxins, the products of bacterial life; the phagocytic function of the leukocyte and chemotaxis; the products of the reaction of the cells of the host in defense, the antitoxins, the bacteriolysins and later the opsonins. The facts on which our present theories of immunity are based have been developed as the result of the labors of many observers during years of diligent research, especially of Ehrlich, who by his work and his "side-chain theory" threw such an illuminating light on the underlying principles of these complicated processes. Although it is believed that the immune bodies are derived from some form of internal secretion, their precise origin is not yet determined. Nevertheless in their activities we have the realization of that vague expression of former days, *vis medicatrix Naturæ*, which is being subjected to analysis, estimate and record in biochemical terms. These potentialities are recognized as residing in and being a physiologic property of the cell which, when stimulated, gives forth a multiplicity of substances differing in each instance according to the stimulant, and specifically adapted to combat the individual intruder or its toxin and designed to exercise an efficient control over the disease, limited only by the responsive powers of the patient. Out of these studies have come our biologic therapy, the supplying to the individual attacked of additional quantities of these physiologic products, antitoxins, lysins and opsonins, to aid in neutralizing the bacteria or their toxins, supplementing the inherent resistance and power to overcome disease. The revelations of bacteriology, the simplicity and precision of its diagnostic tests, the preventive methods against infections and the utilization of the products of humoral and cell metabolism for protection against and cure of disease form the most romantic and brilliant pages in the history of medicine.

In addition to bacteria certain other forms of microorganisms classed as protozoa are known as etiologic factors of disease and though not numerous as we now know them they are important, notably the plasmodium of malaria, the ameba of tropic dysentery, the spirochete of several diseases. These organisms do not appear to stimulate any such responsive cell activity in defense as do bacteria, and they are combated only by the direct action of chemical substances circulating in the blood, of which quinin has long been a well-known example. Efforts to find remedies of this class have led to the most brilliant success in modern therapeutics, the discovery of salvarsan by Ehrlich. The principle of these chemotherapeutics, the selective affinity of the drug for the invader without damage to the cells of the host, is most suggestive of future possibilities. Already Wassermann announces that eosin and selenium have an elective destructive action on the cells of mouse cancer.

The causative factors of many common diseases are not yet identified and it is an open question whether these microorganisms are vegetable or animal. There is good evidence that some of these, as that of poliomyelitis, are ultramicroscopic. Although in many instances the germs themselves have not been isolated and studied individually, enough is known of their habitat, life history and method of transmission to man, often by temporary hosts, to give effective weapons of protection, as in the case of yellow fever, and suggestions for treatment.

Physiology, by reason of its recent advances, has thrown much new light on disease. The more definite application of physiologic chemistry by Hoppe-Seyler in his investigations of secretions and excretions gave a clearer conception than was obtained before of the processes of digestion and tissue metabolism. This led to the more recent and elaborate studies in cell changes and intracellular ferments, or enzymes. These studies have tended to show that metabolism and function are to be explained along physicochemical lines, and it has

even been said that "the mystery of life lay hidden in the chemistry of the enzymes." The subject of internal secretions has been elaborated by many observations, and Starling has recently announced to us the existence of hormones as their active principle, a hormone for each tissue concerned, which circulating in the blood excites functional activity in other organs and tissues "coordinating the activity of various parts of the complex organism" by which a physiologic equilibrium is maintained. a function hitherto ascribed to the nervous system. Hypersecretion and hyposecretion of these hormones now explain to us conditions heretofore little understood, and such disorders may often be successfully corrected by adding to the supply by opotherapy or diminishing it by surgery. The discovery of the neurons, their axons and dendrites, and their reciprocal relations; of cortical localization of many of the functions of the brain; and increasing knowledge of the terminal nerve filaments and the various electrical reactions of nerves have enlarged our understanding of the nervous system and extended the field of neurology in diagnosis and treatment. The myogenic theory of heart contraction has been productive of a clearer understanding of the heart cycle, the irregularities of function and of heart therapeutics. Experimental interference with the heart-valves imitating disease conditions, and studies in arterial and venous blood-pressure, checked and made more exact by the aid of instruments of precision controlled by electricity and made a matter of graphic record, have led to a more accurate appreciation of cardiovascular dynamics.

Anatomy and symptomatology, heritages coming to us from the origin of medicine, are receiving additions even at this late day, and various complicated syndromes are being unraveled by a better knowledge of disease in the earlier stages of its progress.

New instruments enable us to peer into many of the cavities of the body. The Roentgen ray has permitted us to look within the body and with a great degree of certainty to determine the location, size, form and consistence of internal organs and tissues, and to detect foreign bodies and many diseases. Chemistry and biology, embracing bacteriology, have given us accurate methods of diagnosis. In consequence of numerous new methods the diagnosis of many of the infectious diseases and an ever-increasing number of others is no longer a matter of opinion on which physicians may honestly differ, but rather of laboratory demonstration by microscope. cultures, inoculation, hemolytic tests, etc., giving definite information by which the future conduct of the patient and the treatment may be clearly and effectively outlined.

While the experimental method has determined all progress, the studies themselves have been biologic. All histologic and pathologic studies have been focused in the cell, the unit of vital structure and activity. Its morphology held attention for a long time, but as the limits of the microscope were reached and it failed to reveal the further secrets of the cell, recourse was had to chemistry. Flexner tells us that intracellular chemistry is bearing the richest fruits in the pathology of intracellular ferments and our newer conceptions of immunity and physiology, and that toxicology is the cornerstone of modern pathology. Disease is therefore coming more and more to be understood as the result of a poisoning, present or past, because of the entrance of foreign substances or the presence of the products of perverted cell activity and auto-intoxication. We now look beyond the organ immediately affected and inquire into the identity of the causative organism and consider the disease more from the point of view of an infection than of a disease of the organ in the derangement of which the attack is most manifest. We estimate the physiologic disturbance caused thereby and the capacity for service of the cells of the organ affected. Pneumonia is to-day a general infection, a septicemia with lung localization; typhoid is no longer an enteric fever but rather an infection, the typhoid bacillus circulating in the blood and the most manifest lesion being in the intestine.

According to the views of the day it is the reciprocal reactions between the invading organisms or their products and the fluids and cells of the host that we find the final explanation of symptoms, processes of disease and disturbances of functional activity. These biochemical reactions result in the elaboration and output of a long list of substances previously referred to, the terminology of which so puzzles the casual reader — the lysins, agglutinins, precipitins, aggressins, etc.— the biochemical expressions of the *vis medicatrix Naturæ* — which circulate in the blood and give the biologic tests in diagnosis, the vaccines for protection and the physiologic remedies for the cure of disease. Attacks of these diseases often immunize the individual and leave behind in the blood or cell their traces, which may sometimes be recognized long after. Incidental to immunization the antibodies often sensitize the system and produce the condition of anaphylaxis, from which comes the so-called serum disease and occasionally serious toxic accidents. The solution of the problems of immunity — those of personal idiosyncrasy and possibly of recovery by lysis — is supposed to be closely allied to the quality of these reactions. The phenomena were first described by Jenner in 1798 and they were noted by Magendie in 1839, but it is only recently that they have been brought clearly to our attention by Richet. The full meaning and scope of these phenomena are not yet understood, and anaphylaxis offers a large field for future study.

As we trace the results of these toxic influences of infections and perverted cell metabolism further and further they lead us from acute to chronic infections, often mild and lingering, to tissue changes and degenerations of chronic disease. It is now known that nephritis and other chronic diseases may be inaugurated experimentally by toxic influences. It still remains to be determined how far and in what manner toxic influences are responsible for the more obscure forms of degenerations, and whether or not they inaugurate tumor and cancer formations. As these studies have progressed and the problems of acute disease have become clearer attention is turning more insistently to those of chronic and occupational diseases.

The functional capacity of organs is becoming a more and more urgent problem in our clinical consideration of disease, and tests, as those for kidney function, are being sought in the hope that they will permit the determining of functional efficiency of organs with greater accuracy, and give better standards for prognosis.

In these quests biochemistry looks beyond the cell to its constituents, its colloids, their proteins and lipoids, the molecular affinities of protoplasm. It is a realm of marvelous complexity, yet here it is that the problems of that scientific medicine which we claim to be establishing are being solved. Here it is that the newer pharmacology is being developed. In the laws of the generation, growth and evolution of the cell lie the solution of present and future problems of physiology and pathology. As prob-

lems are solved others of still higher degrees of complexity present themselves and the ultimate solution recedes and as ever eludes our grasp. Our queries lead to the very origin and nature of life itself, to the verge of that gulf between the organic and the inorganic which has ever appeared impassable. Studies in abiogenesis, in the artificial development and growth of cells, work beginning with Traube at Breslau and recently extended by Quincke, Benedickt, Lehmann, Loeb and Leduc, is said to be narrowing the lines of demarcation to such a degree that the existence of this gulf is denied and a crossing only a footstep away is claimed by the enthusiast. Such cells, however, have shown no function, and so long as this essential feature of life is lacking, skepticism of any material advance must continue. The studies of Carrel and others in the growth of tissues separated from the organism, the persistence of function during this latent life, the capacity of such tissue to resume active life and function when transplanted and the successful application in man as in animals, open large fields for investigation and may lead to the solution of problems that will make for a still more marvelous development in future medicine and surgery.

MEDICAL SCIENCE TO-DAY

Thus along these broadly sketched lines the science of medicine has advanced during its third or synthetic stage of development, because of the more intimate knowledge of the processes of organic life gained by experimental research. Medicine overcoming every obstacle in her pathway — superstition, dogma, philosophy and many of the complexities of organic life — and protesting against the sentimentalities that would check vivisection, on which all advance in the biologic sciences depends, has reached her present high estate. Our horizon has been broadened, our views and our practice have been radically changed. Magendie was wont to say that "to express an opinion, to believe, was nothing else than to be ignorant." A better appreciation of the vastness of knowledge, the difficulty of arriving at absolute truth, the impossibility of any one attaining more than a partial view, breed a more modest attitude and a willingness to hold opinions *sub judice* until full proof is obtained and all doubt is removed. Pride of opinion is yielding to an interested attention to the views of others. Professional men throughout the world are being brought together in closer relations, in more sympathetic emulation to avoid error and arrive at ultimate truth. Absolute proofs for the correct interpretation of clinical phenomena are being sought in the laboratory. Method and precision are now coming to characterize medicine in daily practice and in theory.

Medicine has been called an art. We are pleased to acclaim it as a science. Sir Dyce Duckworth well says that "it is an art based on many sciences." In research it is a pure science; at the bedside for the relief of suffering and the cure of disease it must ever remain an art. The more of the science we possess the more of the art do we require to apply it skilfully. Shattuck tells us that in practice one finds a gap between our science and the concrete case varying in width; here and there it may be jumped, but usually it is bridged by the art of medicine.

Medicine has reached the high-water mark in its history. Welch has said: "Great as has been the material, intellectual and social progress of the world during the past century, there is no advance which compares in its influence on the happiness of mankind with the increased power to lessen physical suffering from disease and accident and to control pestilential disease." What is done at the bedside is individual and cannot be properly accredited outside the sick-room. Preventive medicine has amply demonstrated to the world, however, that it is founded on scientific truth, and by its precision, efficiency and success in eradicating disease has freed immense areas of the most fertile land on the globe from pestilence and restored it to the safe habitation of man.

Every age preens itself on its accomplishments. Posterity alone can properly apportion the credit due to each, and "without history a man's soul is purblind, seeing only the things which almost touch his eyes." History shows many backward steps in the march of civilization, many intellectual landmarks temporarily obscured. Medicine is said to have advanced in circles. In the theories of our forefathers in medicine we find suggestions of those of to-day, and wonder often arises that without the aid of the data now available they should have come so near the truth as we know it. This generation has been reveling in a field of unknown extent and value. The fruitage has been abundant and of an apparent richness beyond compare. A correct appraisement of the value of our acquisitions and the true bearings of the work of this generation must, however, await the time when isolated facts have been harmonized and generalizations have been made and historically compared. We should ever bear in mind the thought so beautifully expressed by Sir Michael Foster, that "what we know and what we think is not a new fountain gushing forth from the barren rock of the unknown at the stroke of the rod of our own intellect; it is the stream which flows by us and through us, fed by far-off rivulets of long ago." The additions made should be considered as the talent earned by us and added to those talents which are the heritage from the past.

There is an old Latin saying that "men resemble the gods in nothing so much as in giving health to their fellow man." Whatever our religion may be, whatever our philosophy of life may teach us, if we may accept as a practical working hypothesis that "the highest aims of human endeavor are best and most effectually realized in the good we can do to others," then the exponents of modern medicine in thus doing more than ever for the human race are fulfilling in larger and larger measure their high function in the human economy.

McPhee Building.

INTESTINAL ANTISEPSIS *

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Any rational conception of the possible control of bacterial activities in the intestinal tract took its rise after the thorough establishment of bacteriology on a sound working basis by Robert Koch through his investigations on anthrax, tuberculosis and cholera.

It was well known through the early publications of Woodward, Nothnagel, Uffelmann, Escherich and others[1]

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* This research was conducted under a grant made by the Therapeutic Research Committee of the Council on Pharmacy and Chemistry of the American Medical Association.

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

1. Cited by Strasberger, Ztschr. f. klin. Med., 1902, xlvi, 413.

that under the microscope the feces consisted in large measure of bacteria, although the estimates made were exaggerated. From these observations, the theory of intestinal auto-intoxication, or stercoremia, developed greater impulse which led to more wide-spread practical investigation of drugs of known antiseptic properties.

The foundation for all future work on the bacteriology of the intestinal tract was carefully and broadly laid by Escherich[2] in 1886 in his profound studies of the stools of suckling infants. He it was who first realized how relatively small the numbers of cultivable bacteria are in the feces compared with the host seen in a stained preparation. Whether all these non-cultivable forms one sees are actually dead, or only such as do not find our mediums suitable for growth, cannot be arbitrarily decided one way or the other; it is most reasonable to suppose, however, that they are made up of both sorts in unknown proportions, most authorities favoring the idea that the dead ones chiefly predominate. Whatever be the proportions, they are frequently spoken of together as the "non-viable" bacteria in contradistinction to those which can be cultivated and termed the "viable" bacteria. Many attempts have been made to give expression in figures of the average content of viable bacteria in the stools of normal adults on a general diet; but so many variables have to be taken into account that it is not astonishing that the numbers published vary greatly. Sucksdorff,[3] examining his own stools over a period of twenty-four days, using nutrient gelatin as culture medium, found the count to vary from a maximum of 2,300,000 per mg. to a minimum of 25,000; he judged that 381,000 was expressive of an average per milligram. Gilbert and Dominici[4] obtained 67,000 per mg.; Casciani[5] 16,000 per mg., and Matzuschita[6] 18,000,000. MacNeal, Latzer and Kerr,[7] examining the stools of twelve healthy men in an exhaustive manner found numbers to vary between a maximum of 1,526,140 bacteria per mg. and a minimum of 1,360, with a mean of 116,239. Some have tried to establish a numerical ratio between the viable and non-viable bacteria, by a combination of counting organisms in a stained smear and cultural tests carried out under the most favorable conditions. Eberle[8] believed that from 4.5 to 10.6 per cent. were viable; while A. Klein,[9] coining the term "sterility index" to express this relationship, made it about 1 per cent. Schmidt and Strasberger[10] state that the foregoing figures are too high and affirm that 0.07 per cent. is much closer to actual conditions; they also have calculated by special procedure that a healthy adult excretes each day about 8 gm. (dried weight) of bacteria, equivalent to 128,000,000,000,000. MacNeal, Latzer, and Kerr,[7] after examining 204 stools of twelve men on mixed diet by the same method, obtained an average of 5.34 gm., and Mattill and Hawk[11] by a somewhat different process express this daily output as 8.27 gm.

FLORA OF THE INTESTINAL TRACT

The bacterial inhabitants of the intestinal tract are loosely spoken of as the "flora" of the tract, despite the fact that some are mere "birds of passage" while others may be looked on as steady tenants. Attention has of late been sharply called[19] to the impropriety of speaking of the flora of the stomach, duodenum, jejunum or upper two-thirds of the ileum, because in health and between the intervals of digestion these localities are practically sterile. With the large bowel the reverse is the case, and we may with perfect propriety speak of its having a definite and continuous flora. In this organ we have always present such active indologenous bacteria as *Bacillus coli, B. proteus, B. cloacæ, B. subtilis,* Welch's bacillus, *B. putrificus coli, B. sporogenes,* and some staphylococci.

Bacterial activity, although present in the chyme as it leaves the stomach, does not reach its maximum until the contents of the small intestine are discharged into the cecum and large intestine. Here any unabsorbed products of digestion, or undigested protein or carbohydrate are attacked immediately. The raw protein and amino-bodies are broken down further and we have the production of aromatic oxacids, indol, skatol, phenol, ptomains, hexone bases, mercaptan, hydrogen sulphid, etc. The most dangerous of these Metchnikoff[18] declares are the indol and phenol bodies, which by slow and continuous absorption give rise to symptoms of auto-intoxication and ultimately to scleroses of the arteries and other organs.

That Nature herself makes an effort to keep a portion, at least, of the gastro-intestinal tract free of bacteria has been well known for some years past, although attempts to explain this "self-sterilization," as Kohlbrugge[25] termed it, have not been at all entirely satisfactory. (A very full discussion of this topic is given by Medowikow,[26] Wollmann,[19] and Lindemann.[27]) Briefly stated, it would appear that the absolute or relative sterility depends on a conjunction of several factors, namely, hydrochloric acid in the gastric secretion, bactericidal substances in the secretion apart from hydrochloric acid, bactericidal substances in the succus entericus, particularly stimulated by the passage of fat (Medowikow), mechanical action of the mucus, peristalsis, and the action of the bacterial products of some species having a retarding action on other species. Medowikow states that this bactericidal substance of the gastric juice and succus entericus may not be effectively secreted through the evil effects of overfeeding, starvation, excessive hemorrhage, exposure to great heat, insolation, or to any cause promoting irritation of the mucous membrane of the tract. Surgically this self-sterility of the upper portion of the intestinal tract is of the highest importance, as early pointed out by Cushing and Livingood,[28] who also recommended the feeding of sterile food previous to operations in upper reaches of the tract.

INTESTINAL ANTISEPSIS

In considering any possibility of effecting antisepsis or sterilization of the digestive tract, we have to bear in mind certain definite facts: (1) as regards the tract itself; (2) the choice of the agent to be administered; (3) the technical methods to be employed in reaching results; (4) the interpretation of results.

1. The Digestive Tract.—The tract itself must not be regarded as a dead unresponsive tube 25 or 30 feet in length, but as a living, independently reacting organ

2. Escherich: Die Darmbakterien des Säuglings, Stüttgart, 1886.
3. Sucksdorff: Arch. f. Hyg., 1886, iv, 355.
4. Gilbert and Dominici: Compt. rend. Soc. de biol., 1894, pp. 117, 277.
5. Casciani: Deutsch. med. Wchnschr., 1897, p. 297.
6. Matzuschita: Inaug. Dis., Halle, 1902.
7. MacNeal, Latzer and Kerr: Jour. Infect. Dis., 1909, vi, 123, 571.
8. Eberle: Centralbl. f. Bakteriol., 1896, xix, 2.
9. Klein, A.: Centralbl. f. Bakteriol., I, 1900, xxviii, 834.
10. Schmidt and Strasberger: Die Faeces des Menschen, Berlin, 1905, Ed. 2.
11. Mattill and Hawk: Jour. Exper. Med., 1911, xiv, 433.
18. Metchnikoff: Ann. de l'Inst. Pasteur, 1910, xxiv, 755.
19. Medowikow: Arch. f. Kinderh., 1910, liv, 307. Wollmann: Ann. de l'Inst. Pasteur, 1910, xxiv, 807.
25. Kohlbrugge: Centralbl. f. Bakteriol., I, 1901, xxix, 571.
26. Medowikow: Arch. f. Kinderh., 1910, liv, 307; 1911, lv, 214.
27. Lindemann: Inaug. Diss., Bonn, 1909.
28. Cushing and Livingood: Contributions to the Science of Medicine by the Pupils of William H. Welch, Baltimore, 1900.

which responds in a variety of ways to the entrance of foreign materials. Particularly must be considered its liability to irritation by the use of medicaments possessed of antiseptic qualities, whereby may be directly aided the continued multiplication of the very microbes we wish to subdue. The rapid absorptive power of the mucous membrane may become active in the case of certain agents by rapidly removing them from the field of action, and possibly exerting a harmful action on the body as a whole. Then also the antiseptic agent may be split up through the action of the digestive and intestinal juices and no benefit accrue from its administration; or the drug may combine with the elements of the chyme and be rendered inert.

2. Choice of Antiseptic.—The choice of a practical antiseptic agent has been lucidly set forth by Assmann[29] as follows:

A. It should have a strong germicidal action.

B. It should be relatively non-toxic for the body as a whole, and harmless to the intestinal mucosa.

C. It should be absorbed in small amount.

D. It should suffer no chemical changes whereby it loses any of the above requirements (A-C).

E. It should be so constituted that it mixes freely with the intestinal contents, and therefore be freely soluble.

To these conditions the following might be added:

F. It should be one that acts throughout the whole length of the tract.

3. Technical Methods.—For antiseptic studies on the feces, we have at our disposal the usual plate-culture method with or without the use of special mediums, the direct counting method of Klein[9] as modified by Hehewerth,[30] or that used by MacNeal, Latzer and Kerr,[7] and the centrifugal separation and weighing method of Strasberger.[1]

In criticism of these methods, it may at once be stated that in itself each is an imperfect method for furnishing entirely reliable results.

If we employ the cultural method, it must be borne in mind that any one medium that we elect to use cannot be suitable to meet the growth requirements of *all* viable species. In the next place, given a medium of preference, we have to reckon with bacterial antagonisms which may materially influence the count. Also some have conceived that a sufficient amount of the antiseptic agent may be carried over into the culture medium and suppress growth of some bacteria. Then on account of variation in technic of different workers it is difficult to draw comparisons of results; adequate standard methods are therefore urgently required. Lastly, not all bacteria grown out necessarily bear any direct relation to putrefactive processes. But at this point, one overpowering advantage that the cultural method has over its competitors is that by further analysis we may be able to determine the presence of indologenous types and so judge directly of the value of the antiseptic drug employed.

The counting method of Klein and Hehewerth, although most carefully elaborated, has within it certain defects that can be productive of only very approximate figures, and in unskilful hands would be entirely untrustworthy. Less objectionable, but more difficult, is MacNeal's method of adapting the Thomas-Zeiss blood-counting apparatus to the enumeration of bacteria in the stool.

The most popular method of to-day is that of Strasberger, the centrifuging and weighing method of determining the bacterial content of the stool, which I have used. As Strasberger himself declares, the method gives only approximate results, and in the hands of one individual fairly comparative results; but in the hands of different workers, results when compared together vary in an amazing degree. For instance, using the original Strasberger technic, or some slight modification of it, the values expressive of the percentage relationship of dried bacteria to dried stool of normal persons on a mixed diet as found by different workers are given in the accompanying tabulation:

RELATIONSHIP OF BACTERIA TO STOOL, FOUND BY STRASBERGER TECHNIC

Investigator	Relationship, Per Cent.
Strasberger	24.3
Schittenhelm and Tollens**	42.0
Lissauer *	8.67
Tobaya †	11.2
Sato ‡	24.39
Berger and Tsuchiya	12.6
Steele	18.1
Friedenwald and Leitz§	16.87
MacNeal, Latzer and Kerr	26.9
Mattill and Hawk	27.93
Harris	9.18

** Schittenhelm and Tollens: Zentralbl. f. inn. Med., 1904, xxv, 761.
* Lissauer: Arch. f. Hyg., 1906, lviii, 136.
† Tobaya: Quoted by Sato
‡ Sato: Ztschr. f. exper. Path. u. Therap., 1910, vii, 427.
§ My calculation.

Obviously, such marked variations in results are rather startling and weaken one's faith in the efficiency of this method. Ehrenpfordt[31] remarks in his criticism of the method that there must remain in suspension with the bacteria bodies whose absolute weight is greater, but which, on account of their larger surface, offer greater resistance to the precipitating force and thus remain suspended. If the force of centrifugation is increased, these bodies will be ultimately precipitated, but so also will large numbers of bacteria. Undoubtedly also, foreign substances which are of absolutely greater weight, but which, on account of being in a state of fine subdivision, are relatively of the same weight as the bacteria, will also remain suspended, and so be carried over continuously and introduce error into the final result. Strasberger himself pointed out that certain amounts of soluble nucleoprotein may always be carried over. Berger and Tsuchiya[34] made a series of tests and found that this nucleoprotein ran from 0.2 to 0.9 parts per thousand in the feces in normal conditions, and might in catarrhal conditions reach as high as 3.8. Ehrenpfordt considers that this substance constitutes a negligible error, as much of it is washed away in the process of centrifugation.

Probably one factor stands out preeminently as a source of error and that is the value of the judgment of the operator in interpreting the clarity of the supernatant fluid, for this constitutes a critical point. In his original paper Strasberger was content to cease washing the fecal sediment when the supernatant fluid remained "moderately clouded" (*mässig getrübt*), a condition which allowed a tremendous degree in latitude of interpretation. Even when "clear" to the naked eye, the fluid may still contain considerable bacteria, and the sediment an abundance of them. I have taken in my work an index of clarity to mean not more than an average of 15 bacteria per field of the one-twelfth inch oil-immersion lens when one 1.5-mm. loopful of fluid removed by a pipet from the central part of the tube is dried on a slide without spreading. The pipet should be carefully wiped and the first drop discarded lest a slight surface

29. Assmann: Ztschr. f. Tiermed., 1911, xv, 122, 264, 352.
30. Hehewerth: Arch. f. Hyg., 1901, xxxix, 321.
31. Ehrenpfordt: Ztschr. f. exper. Path. u. Therap., 1910, vii, 455.
34. Berger and Tsuchiya: Ztschr. f. exper. Path. u. Therap., 1910, vii, 437.

film (of fat and bacteria) adhere to it on withdrawing the pipet from the centrifuge tube. One can never free the sediment of bacteria, and the number remaining undisengaged when the supernatant fluid is clear varies tremendously, in spite of continual rubbing up of it at the end of each centrifugation. The second great cause of error, the admixture of particulate foreign matter, cannot be dealt with successfully by a second centrifugation. I have attempted to overcome this by slowly filtering the collected supernatant fluid through wet absorbent cotton (from 4 to 5 sq. cm.) packed not too tightly in the bottom of a funnel 6 cm. in diameter. The cotton is afterward removed, its retained fluid squeezed out into a centrifuge tube, and then it is torn up into small fragments, cast into the tube, 40 c.c. of the acid solution added and the whole shaken violently for two minutes. The cotton is next to be removed and squeezed dry, and the tube is then whirled for five minutes at 1,500 revolutions per minute, its contents added to the general collection, and the resulting sediment again washed until the fluid remains unclouded.

Some operators say that the feces ought not to take more than 300 c.c. to complete the washing of the sediment "clear"; I have never succeeded in doing it with less than 600 c.c. and on an average 1,000 c.c. Further, it is quite impossible to precipitate the bacteria from the alcoholic solution in five minutes at 3,000 revolutions per minute, which Ehrenpfordt states is all that is necessary. With the suspension containing from 60 to 70 per cent. of 95 per cent. alcohol, it consumes, in my hands, one hour and a quarter before the "clarity index" is reached, using a centrifuge with a 15 cm. arm-radius and running at 3,000 revolutions per minute.

As a result of my investigation, I am of the opinion that if workers in this country, at least, are to continue using the method, some endeavor ought to be made to unify or standardize the technic; otherwise interlaboratory results cannot be considered comparable.

4. Interpretation of Results.—Considering the merits, then, of these three methods used as indexes for interpretation of results, I am fully convinced that the cultural method in the hands of the thoroughly initiated affords us data of such value that no mechanical method, dealing only with biologically inert matter, can give. One *must* know what these bacteria are, where they come from, what they do chemicobiologically, and how they are influenced by intestinal medication; and one other point in favor of the biologic method is its relative freedom from technical details, which comparatively results in a great saving of time and enables us more extensively to cover the field of investigation. It may be stated here in this connection that a single Strasberger examination cannot be completed under five days of continuous work —Mattill and Hawk mention seven—nor can one person take care of more than two stools per day with convenience.

PREVIOUS WORK

Probably Bouchard[35] more than any other is to be regarded as the pioneer in intestinal antisepsis. He drew attention to the chain of symptoms grouped under the names "auto-intoxication" or "stercoremia" and he attempted to prove that the urines in such cases were possessed of peculiar toxic principles conferred on them by absorption of putrefactive bacterial compounds from the intestinal tract. Attempts were made by him to lessen putrefaction by administering charcoal, naphthalin and iodoform internally. Baumann,[36] using the method for the determination of the ethereal sulphates in the urine as the gauge of absorption of putrefactive substances, was probably more responsible than any one else in putting calomel so high in the list of the so-called intestinal antiseptics, a place it has no right to hold based on any distinct antiseptic action. Morax[37] repeated Baumann's experiments and concluded that calomel acted in reducing ethereal sulphates not by any antiseptic action on intestinal bacteria, but by removing their putrefactive products rapidly from the bowel through active peristalsis. F. Müller[38] demonstrated that by increasing the carbohydrates of the food, indoxyl could be completely removed from the urine. Biernacki[39] amply confirmed Morax's observations, and showed that a milk diet was quite as effectual as calomel in lowering the ethereal sulphates. Fürbringer[40] placed no faith in calomel or naphthalin in cutting short the clinical course of typhoid fever; nor by culture methods was he convinced that either of them had any influence in reducing the numbers of the bacteria present in the stools. Stern[41] demonstrated culturally that *B. prodigiosus* introduced into the canal along with the food was not restrained at all appreciably by calomel. Schütz[42] proved conclusively that *Spirillum metchnikovii,* which ordinarily succumbs in the dog's intestine, appears in a viable condition in large numbers following the administration of calomel. Evidence given by the Strasberger weighing method, in the hands of its author[1] and by Feigen[43] demonstrates that the bacterial output is markedly increased above the normal (from three-fourths to two times). On the other hand, Berger and Tsuchiya[24] found a slight reduction in the bacterial output.

A great array of other drugs has been tested culturally, and reports pro and con have been expressed by the authors. For instance, Sucksdorff[3] claimed to have obtained a drop of one-third in numbers of colonies in his own stool after taking 3.6 gm. of quinin in divided doses; and even a more marked drop followed the administration of 2.1 gm. naphthalin. Kumawaga,[44] using 14 gm. acetanilid, U. S. P., on a dog, reported a reduction of colonies to the proportion of thirty-seven to one. Salkowski[45] got a considerable reduction of bacteria in the feces of a dog fed at intervals with chloroform water. Stern[41] found no effect following naphthalin, betanaphthol, salol and camphor. Von Mieczkowski[46] in cases of ileocecal fistula tested the antiseptic values of bismuth, silver citrate, tannopin, betanaphthol and menthol by mouth. With the exception of menthol, his results were of no value; in the case of the latter there appeared to be a substantial reduction following the giving of such amounts as from 10 to 13 gm. in divided doses. As late as last year, Assmann[29] reported negatively on guaiacol cinnamate (styrakol), tanninformaldehyd (tannoform), tribromphenol-bismuth (xeroform) and bismuth subgallate, using the culture method to gauge results. He employed dogs fed on milk-rice and meat-rice diets. In the same manner he tried the effects of two different silver-protein solutions (so-called "colloidal" silver solu-

35. Bouchard: Lecons sur les autointoxications dans les maladies, Paris, 1887.

36. Baumann: Ztschr. f. physiol. Chem., 1886, x, 123.
37. Morax: Ztschr. f. physiol. Chem., 1886, x, 318.
38. Müller: Mitt. a. d. Würzburger Klinik, 1886, ii, 352.
39. Biernacki: Deutsch. Arch. f. klin. Med., 1892, xlix, 87.
40. Fürbringer: Deutsch. med. Wchnschr., 1887, xiii, 209, 235, 257.
41. Stern: Ztschr. f. Hyg., 1892, xii, 88.
42. Schütz: Arch. f. Verdauungskr., 1901, vii, 43.
43. Feigen: Inaug. Diss., Bonn, 1908, p. 39.
44. Kumawaga: Virchows Arch. f. path. Anat., 1888, cxiii, 134.
45. Salkowski: Virchows Arch. f. path. Anat., 1889, cxv, 339.
46. Mieczkowski: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1902, ix, 405.

tions), which had been superficially tested by Klimmer[47] in 1900. If given in a solution of gum acacia along with the food, the results proved encouraging as the colonies per milligram of feces fell at times quite low. In the giving of colloidal silver preparations to man, it ought to be borne in mind that absorbed silver might be ultimately in part laid down in the skin. In the dog, Klimmer states that absorbed silver is laid down in the intestines, liver and spleen, but *not* in the nervous system, muscles, ligaments or skin; in the dog the skin is devoid of sweat-glands and this may be sufficient explanation why no silver is deposited there.

By the Strasberger technic the following agents have been literally "weighed in the balance and found wanting": naphthalin, thymol, silver citrate, betanaphthol and salicylic acid (doubtful), by Strasberger,[48] magnesium dioxid and iodo-anisol by Feigen;[43] in cases of intestinal catarrh, negative results were obtained by Friedenwald and Leitz[49] using salicylate of bismuth, salol potassium guaiacol-sulphonate (thiocol), acetyl-salicylic acid (aspirin) and thymol; while favorable results with biehlorid of mercury and ichthyol albuminate (ichthalbin) were noted; but the sharpest fall in bacterial excretion was obtained in a case of intestinal catarrh with hyperacidity when the patient was simply put on a change of diet! Berger and Tsuchiya[34] report a lessened bacterial output by the use of a patented preparation of agar-agar and hydrogen dioxid. Steele[50] found that in normal persons the administration of betanaphthol and bismuth salicylate caused a slight fall in the bacteria excreted.

RELATIONSHIP OF BACTERIA TO STOOL, FOUND BY STRASBERGER TECHNIC (AUTHOR'S FINDINGS)

Patient	Date	Drug Dosage	Feces		Bacteria		Colonies in Millions, Per Gram	Indican in Urine	Appearance of Carmin Indicator
			Total Moist	Total Dried	Total Dried	Per Cent. Relation			
Salol Test									
Rb.	3/4/12	0	130	9.3	0.7	7.54	167	+++	0
	3/8/12 } 3/9/12 }	6.0	390	101.79	4.13	4.06	53	+	0
	3/10/12	0	165	34.48	6.4	18.56	110	+	+++
Mt.	3/7/12	0	785	†	†		150	+++	0
	3/8/12 } 3/9/12 }	6.0	0 205	26.65	2.62	9.41	840	++	0
	3/11/12	0	650	131.49	3.64	2.76	820	++	+++
Betanaphthol Test									
Ma.	3/25/12	0	140	28.89	1.31	4.55	30	—	0
	3/26/12 } 3/27/12 }	4.0	80 185	† 42.60	† 2.14	5.02	120 34	— —	0 0
	3/28/12	0	40	4.40	0.28	6.54	460	—	+++
	3/29/12	0	175	31.90	1.65	5.19	214	—	+++
	3/30/12	0	180	27.88	3.09	11.1	87	—	0
Ro.	4/27/12 } 4/28/12 }	4.0	320	77.08	14.27	18.51	320	+	0
	4/29/12	0	185	12.32	2.84	23.11	700	+++	+++
	5/1/12	0	‡	‡					
	5/2/12	0	235	8.15	2.39	29.41	10	+	0
	5/3/12	0	153	14.38	2.17	15.09	37	+	0
Guaiacol Carbonate Test									
Zm.	4/27/12 } 4/28/12 }	4.0	35	8.66	1.92	23.38	950	+++	0
	4/29/12	0	90	14.99	4.14	27.67	355	++++	+++
	4/29/12 •	0	150	12.46	3.18	25.44	85	0	+++
Kf.	5/6/12 } 5/7/12 }	4.0	‡	‡					
	5/9/12	0	345	84.73	11.86	14.00	500	+++	+++
	5/10/12	0	100	14.97	1.94	12.95	540	+	0
	5/11/12	0	160	38.24	3.77	9.84	670	+	0
	5/14/12	0	180	22.19	5.07	22.87	30	+	0

• Further observations impossible, as patient was transferred to surgical ward. † No determination. ‡ Stool lost. — No test.

AUTHOR'S WORK

My own work on which I shall now briefly report was undertaken at request of the Council on Pharmacy and Chemistry with the object of testing the combined values

47. Klimmer: Ztschr. f. Tiermed., 1900, iv, No. 4.
48. Strasberger: Ztschr. f. klin. Med., 1903, xlviii, 491.
49. Friedenwald and Leitz: Am. Jour. Med. Sc., 1909, cxxxviii, N. S., 653.
50. Steele: Jour. Med. Research, 1908, xiii, N. S., 93.

of methods and drugs in this very doubtful field of intestinal antisepsis. On account of the rather limited time at my disposal, a series of unlooked-for interruptions and the length of time required in making analyses, the results are not so extensive as might be wished for, but they have been to me very illuminating and valuable.

The investigation naturally enough fell into two parallel lines of work, the one an application of the Strasberger technic; the other a bacteriologic inquiry used as a check or control on the first. The drugs tested were salol, betanaphthol and guaiacol carbonate. Three cases were used for the development of the Strasberger technic, and when that was acquired, six more furnished the real basis for inquiry. None of these persons suffered from intestinal disturbances. All were put on the well-known Schmidt-Strasberger diet, consisting of toast, milk, eggs, butter, potatoes, meat and oatmeal gruel in proper balance and sequence.

Half a gram of feces was always accurately weighed out for the centrifugation process, and 1 gm. for the bacteriologic examination. The gelatin plates were left at room temperature (15 to 23 C., depending on seasonal and steam-heat alternations) for at least five days; the agar-cultures were grown for the most part at 37 C. for forty-eight hours, and less frequently for seventy-two hours; the extra day of incubation did not affect the count sensibly, if at all.

The bacterial species predominating were *B. coli* and streptococcus, the former in greatly preponderating numbers, except in one case in which the species were in reverse order. *B. lactis aerogenes* was met with in few numbers in two cases; *B. cloacæ* in one; *B. coli anaerogenes (?)* in one; an undetermined yellow coccus in one; and *Staphylococcus albus* in another case; neither *B. proteus* nor any spore-bearing aerobe was found. Anaerobic tests were not carried out as a routine measure, as time was not available. Three tests were made for the presence of spores of Welch's bacillus (*B. aerogenes capsulatus*), and in each case positive cultures were obtained with 0.1 c.c. and with two loopfuls (1.5 mm. diameter) of a one-tenth dilution of the fecal sample, thus proving a relative abundance of viable spores of this organism in each stool.

Each agent was given to two patients, respectively, in six divided doses: salol 6 gm., beta-naphthol and guaiacol carbonate 4 gm., and with the first and last dose of each, a capsule containing 0.3 gm. of powdered carmin to indicate the visible limits of drug distribution and action.

In most instances the indican in the urine was followed daily by qualitative tests only. It was noted that as a rule less was apparent following the administration of the antiseptic, but inasmuch as the indol content of the stools was not followed, the value attached to such observations is considerably lessened.

In so far as figures go (see table), mine do not go to prove that any of the antiseptic agents employed exerted any beneficial action. In the bacterial count, such variations as occur indicate nothing more than what might be found in running a series of daily counts on an individual over a period of several days. This is shown by Sucksdorff; in an investigation of over twenty-four days on one individual the figures varied from a maximum to a minimum a little over ninety times. The greatest variation of colonies in my tests is shown in Patient "Ro" (betanaphthol) in whose case the figures sank from 700 in the medicated stool to ten in the one following, which was not exposed to the action of the drug. It is obvious, too, that the figures obtained by the Strasberger technic show nothing favorable to the action of the drugs, using either the absolute daily bacterial output or the percentage relationship of dried bacteria to dried stool as bases of comparison.

To generalize seriously from the very small number of experiments would be unwise, but so many have reported "favorably" on drug action based on really small falls in percentage relationship that I cannot refrain from pointing out what Strasberger[51] himself does not accentuate frankly in his first article dealing with the value of the technic, wherein in one and the same person (normal) in a series of fourteen counts the percentage relationship varied from 68.4 to 7.0, and in three cases the absolute output in three-day periods varied from 37.5 to 12.3 gm. MacNeal, Latzer and Kerr's experiments[7] show variations in twelve average percentages of 20.8 to 34.62 and in absolute output per day of 1.87 to 9.15. Hence I feel that if we are to accept results on the basis of figures alone, those obtained by the Strasberger technic are open as freely to criticism as are those obtained in the past by purely bacteriologic counts. So I believe that moderate falls in percentage relationship (which are usually obtained) may be expressive only of variations within the normal, and one must be extremely conservative then in arriving at any positive conclusion as to the effectiveness of any drug.

Moreover, were results trustworthy, can we by employment of this technic say what organisms are killed off, saprophytes from the contents of the small bowel, or parasites from the cecum or colon, indologenous or non-indologenous? We cannot. To-day as formerly we stand in need of a method which, aside from the production of mere figures, can tell us what organisms we have to deal with, what their biochemical processes are, and how this or that drug is acting in reducing both numbers and species, and in what location in the tract reduction is effected. Such information can be obtained only from the application of modern ideas of biochemistry and pharmacy in conjunction with present-day bacteriologic knowledge and technic, and it will be along such lines that future progress will manifest itself.

In conclusion it may be said that in spite of so-called "favorable reductions" being obtained by any method whatsoever, our plate-cultures plainly inform us that antiseptic drugs fail to kill off per gram of feces, millions of indol-producing bacteria, whose habitat is the large intestine. When some agent is put into our hands that, acting particularly in the large bowel, can consistently reduce those millions to hundreds of thousands, and these to hundreds, we may begin to talk comfortably about the great value of this or that form of intestinal medication. And on the basis of evidence, we can still heartily agree with the remarks of Friedenwald and Leitz[49] who said that "regulations of diet, together with the evacuation of the bowels, is the most effectual method that we have at hand of reducing the excessively high bacterial content of the large intestine".

I wish to acknowledge the debt of gratitude I am under to Prof. Lewellys F. Barker, of the Johns Hopkins Hospital, Baltimore, and his several house officers and to Drs. Sellards and Austrian, who have by their kind services made this contribution possible.

ABSTRACT OF DISCUSSION

DR. GEORGE M. STERNBERG, Washington, D. C.: I think it extremely probable that the negative results from the use of the so-called intestinal antiseptics will by further researches be shown to be what might have been expected. Indeed, I

51. Strasberger: Ztschr. f. klin. Med., 1902, xlvi, 439.

have never had any especial faith in the use of intestinal antiseptics that have been proposed and largely used by the profession. I do not mean to say that they may not have had a valuable therapeutic effect, but that that effect was from destroying microorganisms in the intestinal canal I have doubted very much and this doubt is confirmed by the paper I have just heard.

DR. HORATIO C. WOOD, JR., Philadelphia: The effect of antiseptics in the colon seems to me to be a problem which is hardly worth the solving. As a practitioner of medicine I never expect to get any antiseptic action in the colon from an internal antiseptic. I think that is absolutely hopeless. What we want to do, if possible, is to find some drug which will influence bacterial multiplication in the upper part of the intestine.

DR. J. H. MASON KNOX, JR., Baltimore: What is the effect of lactic acid bacteria on the number of flora in intestinal content and is it lactic acid bacteria in the solid or the fluid form? Both are advocated, and, particularly, do these organisms have any effect on the presence or diminution of the number of dysenteric organisms which are sometimes found in infants' stools in warm weather?

DR. NORMAN M. HARRIS, Chicago: There was in the unread portion of my paper a reference to some recent work carried out by Assmann in Germany with certain colloidal silver preparations on dogs fed on a particular diet—milk and rice-meat diet—and he thought he was able to lessen regularly and materially the bacterial output which came presumably from the large intestine. His conclusions were favorable to these two preparations. Whether colloidal silver preparations can be given to the human being without producing deposition of silver in the skin is open to question. Therefore, colloidal silver will in all likelihood have to be ruled out from human treatment. What drugs may yet be forthcoming, which are likely to be effective on the intestine, I do not know. I do not think we ought to maintain any strongly pessimistic attitude, however, in regard to future developments.

EFFECT OF IODIDS ON THE CIRCULATION AND BLOOD-VESSELS IN ARTERIOSCLEROSIS *

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The iodids have long enjoyed the reputation of exerting a beneficial influence on arteriosclerosis. Their extensive use in this condition has been largely brought about by the enthusiastic teaching of the French school. Huchard[1] ascribed to iodids the power "to lower arterial tension, to render more active the nutrition of organs, to effect resolution of degenerative processes in the vessel-walls and to lower peripheral resistance." A belief in their power to improve the mechanical factors of the circulation and to act favorably on the vessel-walls forms the basis of our modern iodid therapy in arteriosclerosis. It will be profitable to weigh the evidence on which this belief rests.

I. EFFECT ON BLOOD-PRESSURE

Potain[2] was one of the first to attribute the virtue of iodid to a lowering of blood-pressure, which he considered was brought about by its action on the heart and vasomotor nerves. Animal experiments to determine this point have given somewhat conflicting results. Sée and Lapicque[3] gave intravenous injections of potassium iodid and noted first a rise then a fall of blood-pressure, which they attributed to heart weakness.

Huchard and Eloy[4] obtained a marked fall in blood-pressure following the administration of potassium iodid to rabbits, but only after large doses. A very careful series of experiments on animals was carried out by Prevost and Binet[5] by means of injections of both iodin and iodid salts. They failed to obtain any effect on arterial pressure from moderate doses, while excessive doses produced a fatal fall.

Isaak and Vander Velden[6] observed that following the injection into cats of iodid-egg albumin there was slowing of the pulse and a fall in the pressure, as a result of vagus stimulation, whereas after sodium iodid and potassium iodid no such effects were produced. Barbera[7] reported a similar effect on pulse and pressure from the injection of large doses of sodium iodid in animals, but attributed the result to a paralysis of the depressor nerves of the heart. In rabbits neither organic nor inorganic compounds caused any variation in the pressure. Likewise, in frogs, Kraus[8] detected no influence of various iodid preparations on the arterial tension.

The most exhaustive and convincing experiments of Gumprecht[9] led him to conclude that in the rabbit small and large doses of iodids were without influence on the pressure; that only extremely large doses endangering life caused a fall in tension; that neither a local dilating action on the vessel-wall nor a paralysis of the vasomotor center could be demonstrated.

The clinical evidence is not of a positive character. In reviewing the literature one is struck with a surprising difference of opinions on the part of clinicians as to the influence of the iodids on arterial tension. The problem has not received the careful study that its importance deserves. It must be admitted, however, that the effect of any slowly acting drug on the pulse is not easy to determine because so many other therapeutic measures, such as cathartics, baths, diet, etc., are usually employed during the iodid treatment.

Asher[10] considers that iodids lower the blood-pressure by acting on the vagus and the depressor nerve of the heart.

Chelmonski[11] advocates iodids to check internal hemorrhage, so sanguine is he that they lower arterial tension. Lewy[12] has seen no vasomotor action of iodids in health, but in disease of the arteries and heart he maintains that it acquires this property. This idea is strengthened by the observations of Thaussig,[13] who produced, by daily doses of iodipin in chronic lead-poisoning with hypertension, falls of 80 to 110 mm. Hg in the course of one to three weeks. A similar fall in a case of lead-poisoning was obtained by Pal[14] (165 to 75 mm.) by administering

* Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Huchard: Traité de thérap. appliqueé, Paris, 1897, i, 295.
2. Potain: La clinique médicale de la Charité, Paris, 1894.
3. Sée and Lapicque: Bull. de l'Acad. de méd., 1889, xxii, 328.
4. Huchard and Eloy: Bull. gén. de thérap., August, 1892.
5. Prevost and Binet: Action de l'iode et des iodures sur la pression arterielle, Rev. med. de la Suisse, 1890, No. 8.
6. Isaak and Vander Velden: Untersuchungen über das Verhalten des Kreislaufs bei Zuführ jodierter Eiweiss-Körper, Med. Naturweiss, 1907, Arch. i, 105.
7. Barbera: Ueber die Erregbarkeit von Herz und Gefässnerven nach Injectionen von Iod, Arch. f. d. ges. Physiol., 1897, lxviii, 434.
8. Kraus: Die Pathologie des Schilddrüse, Verhandl. d. Kong. f. inn. Med., 1906, p. 38.
9. Gumprecht: Die Bedeutung des Iods als Vasomotorenmittel, Verhandl. d. Kong. f. inn. Med., 1901, xix, 260.
10. Asher: Discussion, Verhandl. d. Kong. f. inn. Med., 1901, xix, 283.
11. Chelmonski: Iodnatrium und Iodkalium als Heilmittel bei Blutungen, Arch. f. klin. Med., 1899, lxiii, No. 5, p. 636.
12. Lewy: Discussion, Verhandl. d. Kong. f. inn. Med., 1901, xix, 283.
13. Thaussig: Zur Kenntniss der Gefässwirkung des Iods, Wien med. Wchnschr., 1902, lii, 1399.
14. Pal: Quoted by Janeway (see Footnote 23).

potassium iodid in doses of 5 gm. per diem for only a few days.

On the other hand, there is excellent authority for believing that iodids do not in therapeutic doses exert any influence on the size of the arterial lumen or on the heart's action (Romberg,[15] Harnack,[16] Cushny,[17] J. Mackenzie[18]).

Gumprecht's clinical studies are in accord with those he made in animals, viz., that single doses of iodids do not alter blood-pressure and that the long-continued use of iodids has no constant and distinct influence on pressure either in healthy individuals or in the subjects of arteriosclerosis. In a number of cases of arteriosclerosis with hypertension, I have given a single daily dose of potassium iodid for several days. I have been unable to obtain either an immediate or a remote effect on the blood-pressure.

A decrease in the viscosity of the blood was suggested by Müller and Inada[19] as the chief action of the iodids, with a secondary influence on the pressure. Boveri[20] noted a lessened viscosity of the blood both in rabbits and in men, especially those with hypertension, whereas Bachmann[21] obtained no positive results in his experimental work. The most authoritative conclusions come from Determann,[22] who found sometimes an increase, at other times a decrease in the viscosity. He considers these variations are all within the limits of the physiologic variation of viscosity.

It may be properly deduced from these investigations that *the iodids in therapeutic doses are not vasodilators in their immediate action as are the nitrites* (Janeway[23]). In the hypertension of arteriosclerosis (with the possible exception of cases of lead-poisoning) it has not been proved that the continuous administration of iodids lowers blood-pressure. It is improbable that the viscosity of the blood is sufficiently decreased by iodids to alter blood-pressure materially.

II. EFFECT ON BLOOD-VESSELS

When Koranyi[24] announced that by injecting iodipin simultaneously with epinephrin into animals he could prevent the atheromatous effects of epinephrin on the arteries, the explanation of the action of iodid on arteriosclerosis seemed close at hand. He believed that the iodid counteracted the effect of the increased blood pressure excited by epinephrin and thus protected the arterial wall from degenerative changes. Unfortunately his results were not confirmed by later investigation. Biland[25] and also Loeb and Fleisher,[26] in a large number of well-controlled experiments, found that iodin preparations instead of preventing, actually aggravated the arterial necrosis of epinephrin.

It is by no means necessary, however, to abandon our belief in the efficacy of iodid in arteriosclerosis because there is inadequate proof of its action on the pressure. Absorption of the cellular infiltration in the vessel-walls would improve the circulation by enlarging their lumen and restoring in some degree the vascular tonus. That iodids are of benefit in syphilitic endarteritis is generally agreed. According to Osler,[27] there is no other drug that has a direct influence on the coats of the vessels. Whether they bring any structural change in other forms of arteriosclerosis is open to question.

THEORIES OF ABSORPTIVE ACTION

Various theories have been advanced to explain the beneficial effects of the iodids on absorption, more especially in syphilis. The most important are as follows:

A. That iodids are germicidal. This is untenable because the spirochetes are not destroyed by the drug and syphilis cannot be cured by iodids alone.

B. That opsonins are increased by iodids. Van Strübell[28] found the opsonic index was decreased for staphylococci. So far as I am aware, the opsonins in syphilis have not been studied in relation to iodid treatment.

C. That leukocytosis and an increased flow of lymph is induced by iodids (Heinz[29]). Both of these reactions are slight, and, as they also occur from chlorids, cannot be looked on as in any way specific for iodids.

D. That free iodin is liberated in the gumma and in some way promotes absorption (Binz[30]). According to Heinz, the iodin is set free by the leukocytes and as a result of increased metabolism the gumma is absorbed.

E. That iodids increase the permeability of the vessel-walls (Heinz) and thereby promote absorption. This theory is largely hypothetic.

F. That iodids produce a *proteolytic ferment* (Dick[31]). This is best illustrated in the febrile reaction produced by iodids in certain diseases.

THEORY OF PROTEOLYSIS

In 1889, Marchoux and Bourret[32] pointed out that potassium iodid caused a febrile reaction in leprosy, similar to the reaction following the injection of tuberculin in tuberculosis. It is known that potassium iodid may set up a thermal reaction in tuberculosis (Sorel[33]). I have recently seen an exacerbation of fever and pulse in a case of actinomycosis in Dr. Halstead's clinic following large doses of potassium iodid. Furthermore, it exerts a distinct absorptive action on the granulomas of actinomycosis and leprosy as well as of syphilis (Ricketts[34]).

The explanation has been given that the potassium iodid in some way attacks the causative bacteria and sets free the specific toxins.

Sorel investigated this theory in tuberculous guinea-pigs, which he found were very susceptible to the action of potassium iodid. Tuberculous pigs immunized against potassium iodid were still susceptible to the tuberculin reaction and conversely, after immunization against tuberculin, they gave a febrile reaction to potassium

15. Romberg, E.: Ebstein-Schwalbe Handbuch der praktischen Medizin, 1905, iv, 721.
16. Harnack: Centralbl. f. Physiol., 1898, p. 291.
17. Cushny: Pharmacology and Therapeutics, Phila., 1906, p. 570.
18. Mackenzie, J.: Diseases of the Heart, Oxford, 1908, p. 266.
19. Müller and Inada: Zur Kenntniss der Iodwirkung bei Arteriosclerose, Deutsch. med. Wchnschr., 1904, xxx, 1751.
20. Boveri, P.: Viscosité du sang et iode, Presse méd., Aug. 3, 1908.
21. Bachmann, E.: Weitere klin. Beiträge zur Viskositäts-Bestimmung, Med. Klinik, 1910, No. 35.
22. Determann: Das Verhalten der Blutviskosität bei Ioddarreichung, Deutsch. med. Wchnschr., 1908, No. 20.
23. Janeway, T.: Clinical Study of Blood-Pressure, New York, 1904, p. 239.
24. Koranyi: Ueber die Wirkung des Iods auf die durch Adrenalin erzeugte Arterionekrose, Deutsch. med. Wchnschr., 1906, xxxii, 679.
25. Biland, J.: Deutsch. Arch. f. klin. Med., 1906, lxxxvii, 413.
26. Loeb, L., and Fleisher, M. S.: Influence of Iodin Preparations on the Vascular Lesions Produced by Adrenalin, Am. Jour. Med. Sc., 1907, cxxxiii, 903.
27. Osler, W.: Modern Medicine, Phila., 1908, vi, 445.
28. Van Strübell: Die Wirkung des Iods auf den menschlichen und tierischen Organismus, Berl. klin. Wchnschr., 1911, No. 50.
29. Heinz: Ueber Jod und Iod-Verbindungen, Virchow's Arch., 1899, clv, 44.
30. Binz: Die Zerlegung des Iodkaliums in Organismus, Virchow's Arch., 1875, lxii, 124; also Arch. f. exper. Path. u. Pharmakol., 1894, xxxiv, 185.
31. Dick, George F.: Personal communication.
32. Marchoux and Bourret: Quoted by Sorel (see Footnote 33).
33. Sorel, F.: Iodure de potassium et tuberculine, Ann. de l'Inst. Pasteur, 1909, xxii, No. 7, p. 533.
34. Ricketts, H.: Infection and Immunity, A. M. A. Press, Chicago, 1906, p. 434.

iodid. He proved that peritoneal exudate induced in the tuberculous animal by injecting potassium iodid into the cavity contained no tuberculin. From these premises, he concludes that potassium iodid does not split up the bacterial proteid as tuberculin does, and its action is not truly specific. The reaction may be represented as follows:

The union of potassium iodid with antibodies already present in the infected individual gives rise to a ferment which has the power of digesting certain proteids (granulomatous cells, gumma, etc.). In this process, toxic substances are formed which create local inflammation in the lesion and at times a general febrile reaction.

If this hypothesis is correct, we can see how potassium iodid may have the power of setting up a proteolytic ferment which has a *selective* (not specific) action on the diseased granulomatous tissue of the arteries in a certain group of diseases. The digestion and absorption of cellular accumulations are most complete in syphilis, less so in actinomycosis, leprosy and tuberculosis. This conception makes it clear why iodids so remarkably cure one manifestation of syphilis, viz., the round-cell infiltration and yet do not destroy the spirochete or terminate the disease as a whole.

CONCLUSIONS

Iodids in therapeutic doses are not active vasodilators and when long continued do not materially affect blood-pressure.

Iodids do not alter the viscosity of the blood to any marked degree.

The iodids probably owe their beneficial influence in syphilitic acteriosclerosis to the absorption of the cellular exudate in the arteries. The absorption may be brought about by the formation of a proteolytic ferment which is created by the union of iodid with antibody, and which has a selective action on the luetic cellular exudate. It is possible that this selective digestive action may be operative to a lesser degree on the cellular exudate in arteriosclerosis due to other causes than syphilis.

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ABSTRACT OF DISCUSSION

DR. BERNARD FANTUS, Chicago: Clinicians have pretty definite ideas as to the effect of iodids on pathologic tissue—ideas which they have obtained by the study of countless cases and which are almost as reliable as those obtained from experiments on animals. I believe that it can be demonstrated that iodids are capable of diminishing the size of tuberculous lymph-nodes and that it can be proved that certain goiters diminish in size under iodid treatment. Thus, I have records of about a dozen cases of goiter which in six months of iodid treatment have been reduced in size by about three-quarters of an inch to an inch and a half. It seems that the mode of action must in all these cases be similar to that responsible for the benefit obtained in syphilis, and the theory that has been endorsed by Dr. Capps, which seems to me the best theory that we have yet had advanced, would also have to be applied to these other conditions, except that perhaps in case of goiter we would have to think of cellular rather than of bacterial antibodies.

DR. J. A. CAPPS, Chicago: The reference of Dr. Fantus to the therapeutic use of iodids in tuberculosis suggests an interesting point. Pathologists frequently express the opinion that the administration of iodid is sometimes responsible for the development of miliary tuberculosis; that in advanced pulmonary tuberculosis particularly the administration of large doses of iodid causes a breaking down of tubercles and allows bacilli that were partly walled off to be absorbed in the blood and in this way induces a general dissemination of bacilli throughout the body. We need more evidence on this question. This is one of the problems which deserves further attention and which seems amenable to experimental work to determine whether the tuberculous foci are broken down by the administration of large doses of iodid.

CLINICAL OBSERVATIONS ON THE DURATION OF DIGITALIS ACTION *

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The object of these observations is to supplement and continue the studies on this subject which have been in progress in this laboratory for several years. In the present communication it will be my aim to present evidence from a clinical point of view to show that the action of digitalis may, and often does, persist for some considerable period of time after its administration has been stopped. Some of the evidence has been culled from the literature from the recent detailed case reports on the disturbances of the heart's rhythm caused by digitalis, and the rest from daily observations which I have been able to make on patients under the care of several of our foremost clinicians in two of New York's greatest hospitals. After a brief discussion of the phenomena which may be used as evidence of the action of digitalis on the human heart, and the presentation of the several cases showing the duration of these phenomena, we shall be in a position to consider the bearing the observations have on the question of "cumulation" as it is seen at the bedside.

THE PHENOMENA OF DIGITALIS ACTION

For the purposes of this study only such phenomena were chosen as could with a reasonable degree of certainty be attributed, in the cases reported, to the action of the drug and to no other factor, or such as could be ascribed to the action of digitalis when other possible causative factors had been eliminated or accounted for by contiuous observations of the entire course of treatment.

The following abnormalities may be found under a variety of circumstances, and hence before they can be ascribed to the action of the digitalis bodies it is necessary to observe several precautions in the collection of the recorded cases and the observation of patients. First, they must have been absent from the tracings taken before the administration of digitalis. Next, they must arise during the course of its administration. And, lastly, they must disappear at some time not too remote from the discontinuance of the use of the drug.

1. Probably the most striking traceable abnormality in the heart's rhythm which can be assigned to the action of digitalis is the phenomenon of the coupled beat. This is seen only in those hearts in which auricular fibrillation is present. It is well illustrated in the tracings reproduced in Figure 7. Lewis has shown the second beat to be due to a stimulus arising in the ventricle, and hence it is closely similar to a ventricular extrasystole occurring in a regular heart.

2. Sinus irregularities may arise as the result of the action of digitalis in patients with the normal heart

* Read in the Symposium on Digitalis Action in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

* From the Department of Pharmacology, Loomis Laboratory, Cornell University Medical College.

* The expenses of this investigation were borne in part by the Therapeutic Research Fund of the American Medical Association.

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

rhythm, and are probably correctly attributed to stimulation of the vagus mechanism by the digitalis. The irregularity thus caused involves the whole heart, and the period of slowing does not affect isolated beats but usually appears in waves, or so-called phases, during which there is a progressive slowing followed by a more or less rapid return to the normal (Fig. 12). The sinus arhythmia resulting from digitalis action usually differs from the "youthful type" of Mackenzie in the absence of the phasic changes due to respiration, though phasic changes may occur independently of the respiration. The sinus arhythmia of digitalis may be more or less pronounced, and it is best seen if the patient be made to exercise a little and the tracing be then taken as the heart is slowing.

3. Closely associated with the preceding, and having a similar etiology in the action of digitalis on the vagus, is the slowing seen in certain cases of auricular fibrillation in which there is again a progressive lengthening and shortening of the diastolic portion of the beats. The slowing in this case is, however, probably due to the development of a partial heart-block, and it is only the phasic character that is dependent on the vagus action.

4. Occasionally in the very long intervals in the phasic changes of sinus arhythmia, extrasystoles have been observed, arising from intrinsic ventricular impulses. In other patients, in whom there is no sinus arhythmia, digitalis may cause the appearance of extrasystoles. These extrasystoles have been shown to arise

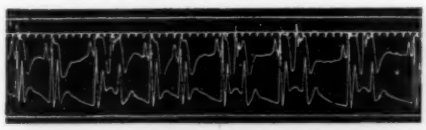

Fig. 7.—Jugular and radial tracing from Patient 4 (Figs. 3 and 6) thirty-six hours after beginning to take digitalis again; only 0.675 gm. had been taken.

in response to a stimulus developing within the ventricle precisely as in the case of the second of the coupled beats, and in both cases this is probably the result of a heightened muscular irritability.

5. Muscular irritability arising from the effects of digitalis on the cardiac musculature is common in animals but of rather infrequent occurrence in man. It is shown in one of my tracings (Fig. 15).

6. Pulsus alternans is attributable to a depression of contractility, and as the production of depression of this function is one of the actions of digitalis, it follows that this response is seen at times as a result of its administration.

7. The conductivity of the auriculoventricular bundle is also depressed by digitalis, and in certain instances this may become so marked as to give rise to partial or even complete heart-block. In some of the patients in whom this condition developed there had been a previous lengthening of the a-c interval, but this is not invariably the case, and the condition may arise in a patient with previously normal a-c intervals.

8. Auricular fibrillation has been reported by Mackenzie as resulting from the action of digitalis in one case, which will be cited in this paper.

9. Simple slowing may be considered a form of digitalis action which can be used as evidence of persistence. But it is to be noted that this effect is in the nature of a return from an abnormal to a normal condition, and consequently its persistence is frequently no criterion of the persistence of the action of the digitalis which caused the restoration of function. Under certain conditions of control, however, it does become possible to regard slowing as a sign of the persistence of action. To do this it is necessary to have determined the slowing effect of rest in the recumbent position on the pulse before any digitalis is given. Then there must be marked slowing as a result of the digitalis, which slowing must more or less speedily disappear after the drug has been withdrawn. In addition, after the cessation of the administration of the drug the other conditions of life of the patient must have undergone no material alteration. This is the least definite of the signs which may be used, and I have found it impossible to include in the following reports any cases which rest on this effect alone on account of their failure to comply with all of the prescribed conditions. All the rest of the phenomena of action being abnormal, they are not as subject to misinterpretation as this certainly is.

Having thus briefly indicated the possible signs by which we may judge the presence of definite persistence of the action of the digitalis bodies, I shall offer in very concise form the records of the cases on which this paper is based. For the sake of order the case reports are arranged according to the phenomena they show and not divided into my own observations as contrasted with those taken from the literature, but with each case report the source of the material is indicated. For the sake of later reference the cases are numbered in an unbroken sequence in the order of presentation. To preserve uniformity the quantities of digitalis taken are expressed in grams of the leaf, as this affords a ready means of comparison of doses when different preparations are used.

CASE REPORTS

CASES SHOWING THE PHENOMENON OF COUPLED BEATS

CASE 1.—From Mackenzie.[1] A coupled-beat action was caused by 2½ gm. of digitalis which passed off within four days; resumption of the drug caused a prompt return of the coupled beats and the effects of an additional gram caused a persistence of the same for a period of eight days, with a second return in three days after only half a gram more had been taken.

CASE 2.—Case of Dr. H. C. Bailey.[2] Persistence of the coupled-beat effect for eight days (and probably for longer) after 9.6 gm. of digitalis.

CASE 3.—From Bailey.[2] During a period of nine days 2.7 gm. of digitalis produced the coupled-beat reaction which persisted for eight days after the last dose of the drug.

CASE 4.—Personal observation. Coupled beats were induced by 3.25 gm. of digitalis taken over a period of seven days and persisted for nine days after the cessation of the drug. A little more than half a gram of the drug (0.675 gm.) in thirty-six hours caused a return of the abnormality eleven days after the last dose of the previous administration.

CASE 5.—Personal observation. Coupled beats and slowing developed during the first course of digitalis treatment. The former lasted for four days after a total of 6.25 gm. of digitalis had been taken in a period of seven days. Return to digitalis after an interval of five days caused a speedy reappearance of the coupled beats and slowing, the former of which persisted for twelve days after the cessation of medication.

CASES SHOWING HEART-BLOCK

CASE 6.—From Hewlett.[3] Heart-block resulted from the use of digitalis and lasted for three days after the discontinuance of the use of the drug.

1. Mackenzie: Heart, 1911, ii, No. 4, p. 305.
2. Dr. Bailey has kindly loaned me the tracings of this and the following patient, previously reported by him, Am. Jour. Med. Sc., 1911, cxlii, 183.
3. Hewlett: THE JOURNAL A. M. A., Jan. 5, 1907, p. 47.

CASE 7.—From Bailey[3] (page 193 and Tracings 7 and 8 in his article). Heart-block persisted for six days after cessation of the use of digitalis.

CASE 8.—From Mackenzie[1] (page 359). Heart-block developed under the influence of 4.5 gm. of digitalis in nine days and lasted for five days following its withdrawal. This occurred as a result of digitalis medication resorted to one week after similar previous treatment which had caused heart-block after 6.5 gm. had been taken.

SINUS ARHYTHMIA

CASE 9.—Personal observation. Sinus arhythmia arose as the result of the taking of 2.5 gm. of digitalis, and lasted for two days after its withdrawal.

CASE 10.—Personal observation. Sinus arhythmia arose in response to 2.6 gm. of digitalis taken in three days and persisted for two days after cessation of the use of the drug.

MISCELLANEOUS AND COMBINED PHENOMENA

CASE 11.—Personal observation. In eight days 10.7 gm. of digitalis gave rise to cardiac irregularity due to muscular irritability, with extrasystole, the former of which phenomena lasted only two days.

CASE 12.—From Mackenzie[1] (page 351). Extrasystoles, heart-block and sinus arhythmia developing after 5.8 gm. of digitalis slowly disappeared after its cessation. The sinus arhythmia lasted the longest, over six days. After a lapse of fourteen days squills did not cause a return of the previous phenomena until it had been taken for from ten to twelve days.

CASE 13.—Mackenzie[1] (page 335). Digitalis caused the development of auricular fibrillation in a previously regular heart. This fibrillation lasted a little over three days from the time of the last dose of the drug. The quantity of digitalis causing this condition was 3.5 gm., an amount which given over the same length of time sixteen days earlier had not produced any such effect.

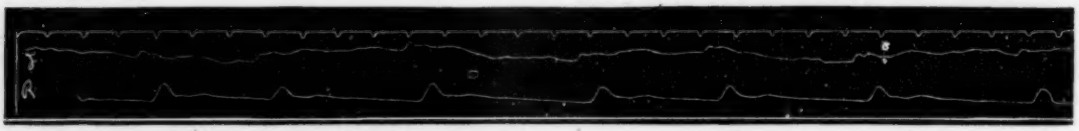

Fig. 12.—Jugular and radial tracing from Patient 9 (Fig. 11), four days later and one day after last dose of digitalis. Slowing and phasic changes.

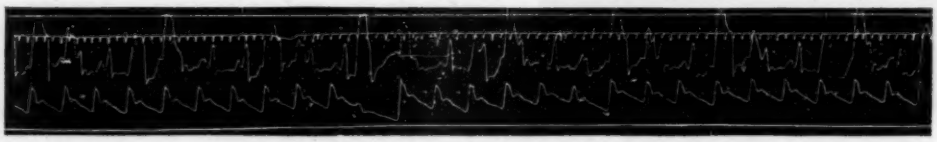

Fig. 13.—Apex and radial tracing from Patient 11, a few hours after the last dose of digitalis. Muscular irritability and one extrasystole.

While all of the preceding case reports deal with the duration of the action of digitalis itself, we have made many clinical observations on strophanthus, chiefly in the form of the pure principle, ouabain, or the crystalline g-strophanthin of Thoms, as it is less correctly termed. Most of these observations were made by my predecessor, Dr. H. C. Bailey, though I have made not a few myself.

The effects are prompt, owing to the fact that the drug is introduced directly into the circulation, and disappear almost invariably within twenty-four to thirty-six hours. By intramuscular injection the onset of the effects is nearly as prompt as by vein, and their duration is the same. These statements are based on the use of the drug in a very large number of cases, presenting a wide variety of cardiac lesions.

SUMMARY OF THE PRECEDING OBSERVATIONS

In five patients with auricular fibrillation digitalis produced the coupled-beat phenomenon with a maximum duration of this abnormality for eight days in two, more than eight in one, nine days in one, and twelve in the fifth. In two of the patients there had been a previous occurrence of the phenomenon in response to digitalis, lasting for four days in each instance. The smallest dose which, given without recent previous digitalis medication, sufficed to bring about this response was 2.25 gm. of the leaf. In three patients in whom coupled beats had arisen there was a return to the use of digitalis after a considerable interval of time, and after this phenomenon had passed off. The amounts of digitalis required to bring about a recurrence of the coupled-beat reaction and the interval which had elapsed from the last dose of the preceding course of treatment, together with the amount of the drug required in the first instance to produce the effect and the time from the onset of medication to the appearance of the phenomenon, are best shown in Table 1. These three cases, together with another (Case 8) will be the subject of further discussion.

TABLE 1.—AMOUNT OF DIGITALIS AND DURATION OF ADMINISTRATION BEFORE ONSET OF THE COUPLED-BEAT PHENOMENON

Case No.	Duration First Course (Days)	Total Dose (Grams of Leaf)	Interval Between Courses (Days)	Duration Second Course (Days)	Dose Causing Return of Phenomenon (Grams of Leaf)
1	7	2.25	5	9*	Less than 1.0
4	7	3.25	11	1½	0.675
5	7	6.25	5	2	Less than 1.0

* This long period in the second course of treatment is owing to the fact that the digitalis was given in very small doses and at long intervals (twice a day) so that, as is seen in the last column, the total given was very low.

Heart-block developed in three instances after digitalis was given to patients with previously normal rhythm, and lasted for three, five and six days, respectively, after the cessation of the use of the drug. In one of these cases (Case 8) the administration of 6.5 gm. of digitalis caused the appearance of heart-block which lasted for a period of less than a week. At the end of this time (one week after a total of 7.5 gm. of digitalis) it required only 2.5 gm. of the drug to bring about a return of the block. This will be discussed again in a subsequent portion of this study.

Sinus arhythmia arose in two patients with normal rhythm in response to digitalis administration, and in each the condition lasted for but two days after the drug had been withdrawn. In one patient with a previously regular rhythm digitalis caused the appearance of muscular irritability which was present for two days after the last dose of the drug. One patient with a normal rhythm developed extrasystoles, heart-block and sinus arhythmia while under digitalis treatment. The sinus arhythmia, lasting the longest, persisted for six days after the drug had been stopped. Digitalis caused the development of auricular fibrillation in a patient whose heart action had been regular. This fibrillation lasted for three days following the stoppage of the digitalis.

A more concise presentation of the major points brought out in this series of observations will be found in Table 2.

TABLE 2.—MAJOR POINTS BROUGHT OUT IN THIS SERIES OF OBSERVATIONS

Case No.	Heart Rhythm	Effect of Digitalis	Dose Causing Effect (Gms. of Leaf)	Total Dose Taken (Gms. of Leaf)	Duration of Effect After Last Dose (Days)	
1	Aur. fib.	Coup. beat.	2.25	2.25	4	(See also Table 1)
2	Aur. fib.	Coup. beat.	?	9.6	8+	
3	Aur. fib.	Coup. beat.	?	2.7	8	
4	Aur. fib.	Coup. beat.	2.7	3.25	9	(See also Table 1)
5	Aur. fib.	Coup. beat.	6.25	6.25	4	(See also Table 1)
6	Regular	Heart-block	?	?	3	
7	Regular	Heart-block	?	?	6	
8	Regular	Heart-block	6.5	7.5	?	(See details above)
9	Regular	Sinus irreg.	2.1	2.5	2	
10	Regular	Sinus irreg.	2.6	2.6	2	
11	Regular	Musc. irrit.	10.7	10.7	2	
12	Regular	Sinus, etc.	5.8	5.8	6	
13	Regular	Aur. fib.	3.5	3.5	3+	

We are now in a position to consider our facts and observations from an analytic point of view.

ANALYSIS OF THE PRECEDING OBSERVATIONS

As we have not the means of determining accurately how much of the digitalis given to man is absorbed and is acting on the heart, we must measure the duration of the action from the last dose, according to the nature and severity of the symptoms produced and their persistence. While the response to digitalis depends in great part on the nature of the heart's lesion and its functional capacity prior to administration of the drug, it would seem that, quite aside from these considerations, the responses to digitalis could be arranged in a sequential order of intensity somewhat as follows: (1) coupled beat, (2) heart-block, (3) combined phenomena, (4) auricular fibrillation, (5) muscular irritability in regular hearts, (6) sinus arhythmia. This arrangement of the phenomena conforms fairly well to the intensity of the digitalis action if we consider the mechanism of the production of each phenomenon and the differences in the individual susceptibilities of the patients. It has the further advantage of being in quite close conformity with the periods of duration of each of the phenomena. This is made clearer in Table 3.

TABLE 3.—RELATIVE INTENSITY OF DIGITALIS ACTION

Digitalis Effect	Mechanism	Duration (Days)
1. Coupled beats	Intraventricular stimulus; fibrillating heart	4-12
2. Heart-block	Depression of conductivity	3- 6
3. Combined phenomena	Simultaneous effects on several structures	6
4. Auricular fibrillation	Direct action on auricular musculature	3
5. Muscular irritability	Direct muscular action, normal muscle	2
6. Sinus irregularity	Stimulation of vagus mechanism	2

If this suggestion as to the relative intensity of the several phenomena of digitalis action is a correct one, then the intensity of the action is apparently the most important single factor influencing the duration of the action after the digitalis has been stopped. This exactly corresponds to the results obtained in experiments on certain animals, which have been discussed in the preceding paper by Dr. Hatcher, and in which we see that the duration of the action is the longer the more nearly the dose given approaches to the fatal dose. This is but another means of expressing the degree of the intensity of action.

To illustrate graphically the varying intensity and duration of action as a result of the therapeutic use of digitalis, I shall introduce a chart (Fig. 17) on which I have projected the curves of three cases and a curve of the average of all the cases embodied in this report.

The base-line of the chart represents the condition of the heart prior to the administration of the digitalis. The therapeutic effects are shown by brackets as a zone of indefinite extent lying between the base-line of no perceptible action and the wide zone of distinctly toxic actions above. The zone of therapeutic action insensibly blends with the zones between which it lies. The ascending black lines illustrate the gradual increase in the action of the digitalis on the heart. These rise with continued administration until they pass into the zone of therapeutic action. This is seen clinically by an improvement in the symptoms and perhaps by a slowing of the pulse. Continuing the use of the digitalis, the lines of action rise further into the therapeutic zone and eventually pass into the zone of distinctly toxic actions. These I have indicated on the margin, but I do not wish to have it understood that in any one case the course of development passes through this sequence, or even that this sequence is strictly accurate in expressing the generalities of a series of cases. It is simply suggestive of a graduated intensity of action, as I have mentioned previously. A given case may show any one of the actions or several of them simultaneously (Cases 8 and 12). The traceable actions of digitalis fall for the most part within the toxic zone. If we let the ordinates represent days and the abscissæ the type and intensity of the response to digitalis, we may illustrate the rise and fall of the intensity of the action of an amount of digitalis producing any given response in the form of a curve. Continuing these curves, as dotted lines, back to the base-line, it will be noticed that I have not represented them as falling abruptly but have represented their descent as consuming a number of days. I base this view of the slow fall on the following observations:

1. In experimental work on animals it is possible to prove that digitalis is eliminated by a slow process and that its removal is proportionately much slower when the dose given is very toxic than when it is small and relatively slightly toxic. As Dr. Hatcher has already entered into the discussion of this, I will do no more than cite it here as a fact which has been proved for certain animals.

2. If we turn back to the details of four of the cases described in the first part of this paper (Cases 1, 4, 5 and 8) it will be seen that we have clinical evidence for the belief that in man, as in animals, digitalis is eliminated slowly. In Case 1 it took 2.25 gm. of digitalis to cause the coupled-beat phenomenon during the first course of administration. After an interval of five days without digitalis, during which time we must suppose that elimination was progressing, and after the coupled beats had disappeared, less than 1 gm. of digitalis was

required to bring about a return of the coupling. This small quantity was sufficient, although it was given in very small individual doses and over several days, during which further elimination was certainly occurring. The coupled-beat effect lasted for eight days, and a second return to digitalis, after an interval of ten days without it, brought about a prompt reappearance of the phenomenon in response to only 0.5 gm. Case 4 required 3.25 gm. of digitalis in the first course to produce coupled beats, and only 0.675 gm. was required to bring the phenomenon back eleven days after the last dose of the first course of treatment and two days after the coupled beats had disappeared. Case 5 required 6.25 gm. of digitalis in the first course before coupled beats appeared, and less than 1 gm. in the second course produced the same response after a five-day interval from the last preceding dose. In Case 8 the appearance of heart-block followed the taking of 6.5 gm. of digitalis; the drug was continued two days longer, raising the amount for the first course to 7.5 gm. After a week without any medication 2.5 gm. of digitalis caused a return of the block.

From these four cases I conclude that the elimination of digitalis in man is slow and that after the disappearance of the traceable signs of its action there remains, in an active state in the tissues, a very large portion of the total digitalis absorbed and acting prior to the cessation of its administration. This period of digitalis action, which cannot be definitely shown to exist by means of tracings or even by clinical signs in the majority of patients, may be termed the *period of latent action*. It is represented by the slowly falling line below the level of obvious action, either therapeutic or toxic, as the case may be. Its duration is of uncertain length. It corresponds exactly, except of course as to time, to the period of latent digitalis action which Dr. Hatcher has shown exists to such a marked degree in the cat.

From these observations I suggest that in man digitalis is more or less firmly fixed in the tissues, probably of the heart, in such a manner that so long as it remains it continues to exert its action in direct proportion to the quantity present. This fixation is such that the drug is but slowly given up and eliminated. Smaller subsequent doses at varying intervals of time after previous administration, but such as fall within the period of latent action, are needed to bring about the return of effects similar to those first produced. This return of action in response to a smaller second dose is due to the direct summation of the drug fixed in the tissues and that introduced subsequently.

The curve of action of ouabain, plotted as in the case of digitalis, would be represented by a line which would rise most abruptly, owing to the introduction of the drug directly into the circulation, and would fall within a period of thirty-six hours. Here, again, we have in man a striking similarity to the behavior of the cat to this glucosid, as shown by Dr. Hatcher. In other words it is rapidly eliminated and it is not firmly fixed, though its immediate action may be no less severe than that of digitalis.

Once more we may apply to man an argument which has been applied to animals in controverting the idea suggested to the effect that the persistence of digitalis action is persistence truly of *action* and not of the drug; in other words, that it is due to the duration of the *effects* of the action of the drug on the heart and not to the continued action of the drug itself. This is shown to be an erroneous conception by the fact that in the case of ouabain (see Case 15), after it had caused the appearance of the coupled-beat action, this phenomenon lasted less than thirty hours. It is possible to repeat doses of ouabain such as cause this effect, at intervals of from twenty-four to thirty-six hours without bringing about any more lasting action than that just mentioned. There seems to be but one conclusion which is logical and in agreement with the observed facts, and that is that the ouabain is not lastingly fixed as is digitalis, and that the phenomenon of the persistence of digitalis action is due, not to the lasting *effects* of any injury to the heart, but to the *actual presence of the drug* in the tissues in active form.

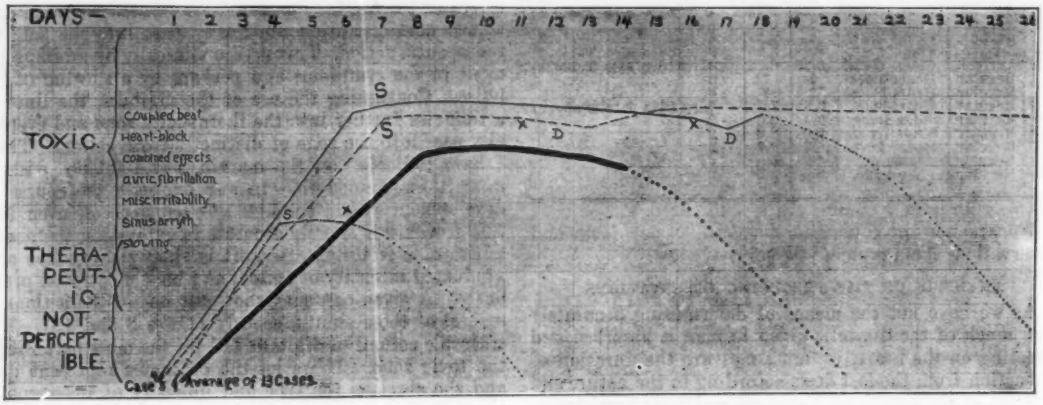

Fig. 17.—Chart illustrating the duration of digitalis action in man. The days are indicated by the ordinates; the type and intensity of the digitalis action by the height above abscissa. The administration of digitalis begins at abscissa and stops, in each case, at the point marked S. The particular toxic action of each case persists to the point marked X. In the two upper lines the point D indicates the beginning of the second course of digitalis administration. The heavy black line is the curve obtained by averaging the several factors for the entire series of cases reported in this paper. It is made to ascend to a mean height of toxicity which is not to be read as corresponding to any one of the special types of action. The phenomena noted in the zone of toxic action are arranged in an arbitrary order of ascent, the reason for which is discussed in the text. The dotted lines of descent are hypothetical and are discussed in the text.

CUMULATION

The use of the term "cumulation" is a very loose one indeed, it being applied to a variety of widely different conditions. Perhaps its most general application is to express the development under small repeated doses of

a drug of symptoms which are much more marked than those caused by a single small dose. Accepting this as best expressing what is meant by the term, I suggest the following mechanism of the development of this condition in the case of digitalis, based on the foregoing material and the points which I have tried to bring out in my discussion.

Mechanism of Cumulation of Digitalis.—Cumulation in the case of digitalis is the result of a simple summation of amounts absorbed and fixed in the tissues, probably of the heart, and, owing to the firmness of this fixation, the intake is in excess of the elimination. The fixed portion continues to exert its typical action on the heart, and this action is directly dependent on the amount of the drug so fixed. The continued use of small doses of the drug, and within certain limits, the interrupted administration of small doses, raises, by the process of summation, the total amount fixed and acting on the heart to such a point that toxic symptoms develop.

NOTE.—In addition to the articles previously cited, the following references will be found of interest:

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Hewlett, A. W.: THE JOURNAL A. M. A., Nov. 4, 1911, p. 1512.
Lewis, T.: Heart, 1910, i, No. 4, p. 306.
Mackenzie, J.: Diseases of the Heart, Ed. 1, 2.
Turnbull, H. H.: Heart, 1910, ii, No. 1, p. 15.
Wenckebach, K. F.: Brit. Med. Jour., 1910, ii, 1600.
Windle, J. D.: Heart, 1911, iii, No. 1, p. 1.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. HATCHER * AND EGGLESTON

DR. DAVID MARVIN, Burlington, Vt.: About a month ago I began experiments with digitalis on man to determine four things: first, whether there was, from a single dose, a continuance of action; second, if it influenced respiration; third, if it slowed the pulse and fourth, its effect, if any, on blood-pressure. I gave 20 minims of tincture digitalis U. S. P. to twenty men and took observations every five minutes over a period of two hours. The results were negative, thus showing that digitalis does not influence respiration, pulse-rate or blood-pressure within two hours after administration of a single dose.

Knowing that Dr. Hatcher had demonstrated a persistence of action of digitalis, for a long period of time, in the cat, I thought I might get the same results in man. I therefore repeated the former dose, using the same number of men and took observations twice daily for three days. The results obtained were as follows: a persistence of action for fifty hours was characterized by an increase in blood-pressure which reached its height in twenty-four hours and then decreased until the end of fifty hours when it reached the normal average. The pulse was lessened. Respiration did not seem to be influenced at any time during the fifty hours.

DR. LOUIS FAUGERES BISHOP, New York: I can confirm everything that has been said about the effect of digitalis on patients with heart disease. We must not lose sight of the fact that the heart action itself is one of the most difficult things to explain in all physiology. We cannot explain it on the ground of nerve action because a great many animal hearts would beat regularly without any nerve connections at all. We cannot explain it on the effect of any intermittent action causing the heart to contract because there is no intermittent action we can discover. So we are compelled to come down to the explanation of the heart beat as an intermittent action due to a continuously active force. Nobody is able to explain that satisfactorily except on one assumption, and that is on the chemical basis. We have to predicate the production in the heart of some chemical substance which is continuously being formed and which reaches a certain point of accumulation which results in the heart-beat; then this substance is either destroyed or modified by the heart-beat so that it has no further action and then when it accumulates again the heart can beat again, which is a perfectly clear explanation of the heart action. The heart after a single beat cannot be made to beat again until after an appreciable interval. My conception of the effect of digitalis is that it modifies in some way this chemical substance in the heart which has to do with the heart-beat just as a chemical mixture is modified by a reagent; soon a certain point is reached at which reaction takes place. Now if part of the reagent that is destroyed disappears, to obtain reaction again so much need not be added. I believe digitalis represents persistence in the heart of a modification of this hypothetical substance which has to do with the heart-beat. In clinical medicine in heart trouble, of course, we all know that fibrillation of the auricle represents the great disease in which digitalis is most effective and that it produces a partial heart-block. A case of fibrillation auricle, that is, a very rapid and absolutely irregular pulse, comes under observation. Large massive doses of digitalis are given until some toxic or physiologic pulse is perceived. I give digitalis until I get vomiting, diarrhea or slowed pulse. After that the very small dose and doses at long intervals will keep up the effect. I saw a patient from the South, who had dropsy and shortness of breath and a pulse of 160, absolutely irregular, and a swollen liver. The patient was given digipuratum, an extract of digitalis. In two weeks he had recovered.

DR. R. L. WILBUR, San Francisco: Is there any satisfactory method, physiologic or chemical, for identifying digitalis in the excretions? Often there are toxic effects from the administration of such drugs because the patient is given the full dose in the ampules provided by pharmacists without regard to weight or age.

DR. ARTHUR D. HIRSCHFELDER, Baltimore: A certain number of patients admitted to hospitals and put at once on digitalis exhibit symptoms of digitalis poisoning or even die suddenly. Although most patients have received digitalis in some form or other before entering the hospital these cases are often ascribed to hypersensitiveness to the drug, whereas Dr. Hatcher's experiments indicate that they may be the result of residual digitalis action. I think that the observations of Dr. Hatcher and Dr. Eggleston throw on those of us who are compelled to apply these things clinically a very delicate question of judgment, and I hope that they will be able to give us some rule for their application in practice. I agree entirely with what Dr. Bishop has said that, as Mackenzie has found, the absolute arhythmia of auricular fibrillation represents the condition in which the most satisfactory results are obtained from the use of digitalis; but I have rarely been able to get the pulse-rate down to 50 without obtaining other undesirable symptoms: palpitation, a feeling of weight on the chest or emptiness in the limbs, and particularly persistent weakness. I think that it is a safer procedure to lower the pulse-rate at first to about 80 and then to go very slowly in lowering it further to the rate at which the patient feels most comfortable.

Where in the scale of digitalis effects which Dr. Eggleston has given would he place the effects on tonicity, which, in Dr. Cameron's experiments done in my laboratory some years ago, seemed to appear before the onset of any arhythmia? Dr. Eggleston's scale also differs somewhat from the one that I had been led to adopt through some experiments on the irritability of heart muscle that I made by faradizing the dog's auricle with gradually increasing currents. The mildest effect was the production of extrasystoles: a slightly greater stimulus and slightly greater irritability caused regular paroxysmal tachycardia with approximate doubling of the rate; and a still further increase caused fibrillation. Evidence from clinical cases seems to harmonize with this view; and it has recently been adopted by Thomas Lewis. Moreover, it harmonizes with the effects which Bredig and Wilke, the physical chemists, observed in the course of rhythmic chemical reactions, such as the catalysis of hydrogen peroxid by mercury under the influence of ascending electric currents. They found that under weak currents the bubbles of oxygen formed in regular rhythm; with increased current they were liberated in pairs like extrasystoles; and when the current was still greater, there

* Dr. Hatcher's paper is published in the *Archives of Internal Medicine* and abstracted in the Current Medical Literature Department of this issue.

was an explosion into a rapid rhythm which simulated tachycardia or fibrillation.

DR. E. W. TULLY, Philadelphia: In the cases of normal hearts, when injecting atropin we get at least a rise of thirty beats during the hour. In cases of typical auricular ventriculation under similar circumstances we get at least forty or sixty, sometimes seventy-five. Clinically, these are the cases in which you know digitalis is going to do good. Take sclerosis thus fibrillated; with a similar amount of atropin injected during the hour you get perhaps fifteen or twenty, an increase of fifteen or twenty beats in the hour. In that case you know you are not doing good clinically with digitalis or any cardiac stimulant. The thing that is interesting in some of these cases is the withdrawing of vagus control. In the cases of auricular fibrillation with high pulse-rate the digitalis seems to calm that excitability. In these neurotic cases digitalis does not seem to do good. In all probability they have lost their function for absorbing and holding digitalis. It seems to me that is entirely possible.

DR. REID HUNT, Washington, D. C.: Returning to the pharmacologic aspects of the subject, quantitative studies, like these, on the duration of the effects of drugs, are so rare that it may be of interest to refer to the only similar studies I remember. Heymans and Masoin found that when a minimal fatal dose of potassium cyanid was divided into fractions and these injected into a rabbit in the course of an hour, death resulted; when, however, the injections of the lethal dose (in fractions) were extended over an hour and a half, the animal recovered. They argued that if a fatal dose of potassium cyanid, which is one of the most rapidly acting poisons, is still fatal when its administration is extended over an hour, there is probably no poison or drug the toxic dose of which can safely be repeated within an hour. It would be interesting to see if conclusions along these lines could be drawn from the studies of Dr. Hatcher on digitalis, that is, if the experiments would permit conclusions as to the shortest period in which it would be safe to administer doses which, taken together, would constitute a toxic dose.

DR. WILLIAM SALANT, Washington, D. C.: The results of Dr. Hatcher are in all probability due to some injury rather than to retarded elimination, for it is hardly conceivable that an organic substance should take so long as thirty days for its elimination. It is doubtful, therefore, whether the increased toxicity observed by Dr. Hatcher is due to slow excretion. Were there any other symptoms noticed during that time besides those due to disturbance of the circulation?

DR. HENRY BEATES, Philadelphia: My studies of digitalis have been limited exclusively to clinical observations, resulting in conclusions explained as follows: It is well known to all of us that in the normal animal, ligation of a branch of the coronary artery results in insular action of the ventricle. I think that fact demonstrates a fundamental principle which governs the clinician in the administration of this remedy in pathologic conditions. That principle is based on this: Given a heart-beat, the contractility of the myocardial cells is not called into action again until the intercellular fluid has assumed its normal condition. We know through studies in the laboratory, that renormalizing, if it may be so expressed, of the intercellular fluid takes place in an infinitesimal period of time. We also know from studies of metabolism that the cell will not perform its function, even though the materials for that cell to functionate are present in abundance, unless the cell is activated by the ions of the necessary crystalloid, as, in the heart, for instance, potassium, barium or calcium. Therefore, in morbid conditions, the action of the cell depends on the normality of the intercellular fluid. And that normality, in turn, is conditioned by the mean pressure existing between the arterial system, on the one side, and the venous on the other; osmosis, osmotic pressure, diffusion, etc., are all conditioned on this equilibrium. In digitalis exists the power of increasing the force of the cardiac beat, and also that very important arterial function, too much overlooked, propulsion. By administering digitalis (and I mean by that a standardized preparation not made from "40 cent leaves" but the $1.20 type), we restore the arterial pressure and thereby reestablish the normal condition of the intercellular fluid. It is then that the myocardial reaction results. The fact that the active principle that does the work of that drug is eliminated, as alleged, with astonishing slowness, is probably explained in this way. There is such a thing as physiologic equilibrium which must not be overlooked. In pain one secures relief with a dose of morphin, for illustration. The function of the nerve is afterward maintained long after elimination has occurred, because physiologic equilibrium has certainly been restored, and the absence of the pain indefinitely certainly does not demonstrate a combination of morphin and protoplasm, which requires all that time to be eliminated. The greatest field to demonstrate the point in question is in nutritional diseases. If a reliable digitalis is given which will give active physiologic effects, you bring about a physiologic normality of the cells of all structures.

MR. OTTO RAUBENHEIMER, Brooklyn: I would like to know from Dr. Eggleston whether the infusion of digitalis which varied over 50 per cent. was made recently, that is, whether it was comparatively fresh, and whether it was strictly a U. S. Pharmacopeia preparation. I would also like to know from the pharmacologists as a member of the Revision Committee of the Pharmacopeia, whether the infusion of digitalis should have any alcohol added to it? It has been stated that this alcohol should be deleted for two reasons. One, in the first place, would be that the average pharmacist seems to be under the impression that the alcohol is added to keep the infusion and for that reason he keeps it in stock bottles and dispenses it. Some say that the addition of alcohol works antagonistic to the action of the digitalis.

DR. ROBERT A. HATCHER, New York: The question of fixation of the digitalins in the tissues of the heart has been investigated by Cloetta and by Straub. I have also used rats, which are nearly a thousand times as tolerant of these bodies as cats, for the investigation of this question, but without success, despite the sensitiveness of the biologic test employed. Schliomensun found that extracts of the heart combined chemically with one of the digitalins, but Straub found that very dilute solutions of these substances did not cause standstill of the perfused frog's heart, whereas we have found that a vastly more dilute solution in the mammalian blood-stream sufficed to stop the heart, suggesting that combination with the tissues does take place, since some of the bodies at least leave the blood-stream of the cat very quickly.

The variability in the persistence of action of the several digitalins is a matter to be borne in mind. Dr. Wilbur is referred to an article in the *American Journal of Physiology*, 1909, xxiii, 303. Ouabain is excreted rapidly by the rat, and I have reason to believe that the rabbit also excretes digitoxin very rapidly. This bears on the question of Dr. Salant, and furthermore, I know of no evidence against the prolonged persistence of action of certain of the digitalins and in favor of the phenomena observed being due to injury alone. We know nothing concerning the excretion of the digitalins in the urine, in which digitoxin was not found after very large doses administered to rabbits.

The full action of digitoxin in moderate doses appears to be exerted slowly, but very large doses act with amazing swiftness after their injection directly into the circulation. The rabbit eliminates the digitalins very rapidly and the action of these bodies persists but a few hours at most in this animal. Dr. Beates is referred to New and Nonofficial Remedies, in which it is stated that digitalin chloroformique is a mixture consisting largely of digitalin true, and that digitalin, German, is a mixture of digitalin, digitonin and other principles.

We must divest ourselves of many preconceived opinions concerning the digitalins, for many of the questions of fundamental importance in the therapeutic use of these bodies have not been investigated.

DR. CARY EGGLESTON, New York: In reply to Dr. Hirschfelder regarding digitalis poisoning, I am of the opinion that patients are not infrequently admitted to our hospitals who are in a state of cardiac decompensation but who have been given digitalis before admission. The previous use of the drug is unknown to the patient and usually not recognized by the physician, who at once prescribes digitalis. We have some observations which lead us to believe that this has actually resulted fatally to the patient, because of the action of an

overdose as a result of summation. Certainly, some of the forms of irregular heart action which I have mentioned as resulting from digitalis might well be mistaken for a primary cardiac disturbance, particularly if tracings are not taken. Its use should not be continued beyond the establishment of one or another of the traceable abnormalities which are known to result from its administration. Not that it is necessary in all cases to go this far, but that one should go no farther. In auricular fibrillation the patient seems to be at his best after the production of the coupled beats, a decided abnormality but apparently a lesser evil than the one from which he was previously suffering. This brings up Dr. Hirschfelder's question regarding tonus. I believe that this is probably among the earliest effects seen, though it may not be evident until late in some cases. It may precede any traceable effect and is to be recognized by an improvement in all of the symptoms. The patient feels better, his cyanosis and dyspnea disappear, the urine increases, and he is able to lie down to sleep. My arrangement of the phenomena of action, I know, does not agree with Lewis' findings in electrical stimulation of the heart, but it conforms to the duration of the action of digitalis, and to a certain extent to the degree of divergence from the normal. I suggest that the effects of electrical stimulation and digitalis are not precisely analogous. The question of repetition of the drug I should say would depend on the results obtained in each case and should be controlled by one's observations. In the choice of the preparation of digitalis to be used I am inclined to the belief that intravenous administration of ouabain may be preferable in the face of acutely broken compensation, and that digitalis (by mouth) should be selected to maintain a prolonged action.

ANTITYPHOID INOCULATION: THREE YEARS' EXPERIENCE WITH ITS USE IN TRAINING SCHOOLS FOR NURSES IN MASSACHUSETTS*

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Pfeiffer's experiment, which led Wright to introduce anti-typhoid inoculation into the British Army, was more far-reaching than one could have imagined at that time. All are familiar with the extensive work which has been accomplished on these lines in the English, German and United States armies.

Inoculation material has been most varied. Heat-killed vaccines have been the most popular and in fact the only preparation used to any considerable extent in man. But animal experiments and a few human inoculations have been attempted with other material. Vincent[1] recommends macerated organisms sterilized by ether. Müller[2] has treated cultures with lecithin and extracted the product with chloroform. Rusznyák[3] has used the typhoid immune serum, while Besredka[4] and Bessau[5] have employed mixtures of the serum and dead organisms. Chemical agents such as silver salts, glycerin, sodium carbonate, formaldehyd solution and phenol (carbolic acid) have been widely used to sterilize cultures. Macfadyen[6] has employed frozen, powdered and filtered organisms. But the most extreme method is that of Castellani,[7] who employs on his third and fourth injection living organisms which have been attenuated by an exposure to 50 C. The advantages and disadvantages of these methods, although worthy of prolonged discussion, cannot be considered at the present moment.

All practical work has been accomplished in artificial typhoid immunity by means of heat-killed vaccines. Pfeiffer and Kolle[8] and Wright[9] recommend heating to 60 C., but Leishman[10] and Russell[11] advise only 53 C. In my work I was guided by the careful researches of Major Leishman[10] and others of the British Commission,[12] whose work alone at that time seemed complete.

It is well recognized that the typhoid bacillus is the greatest foe to the soldier in the field. During the last century nearly all the armies of the civilized world have been devastated by this infection, but the dangers of typhoid communication were not fully realized until the discovery of the specific organism by Eberth in 1880, and its demonstration in the various excreta of the body which followed shortly.

It was shown by Joslin and Overlander[13] that the nurses of Massachusetts were eight times more liable to typhoid infection than others less intimately associated with the sick. For the ten years ending 1908, two to four nurses contracted typhoid fever in the Massachusetts General Hospital alone. According to my statistics[14] there was a morbidity of 1.4 per cent. among the nurses as compared with Joslin's of 1.41 per cent. among the nurses of most of the large hospitals of Massachusetts. This unnecessary prevalence of typhoid fever in the best regulated of our hospitals caused Dr. Mark W. Richardson, secretary of the State Board of Health, who had long been interested in the disease and its prevention, to bring the matter before the governing boards of the Massachusetts General Hospital. Their response was prompt and decisive so that inoculation was started there at once and has been continued regularly to the present time.

In order to produce immunity in such a class of individuals it was necessary to demonstrate the safety of the process and the relative ease with which it could be accomplished. To bring about this result I proposed the use of small doses, frequently repeated, of a low virulence vaccine. My vaccine material was and still is essentially the same as that used by Leishman and Russell.

TECHNIC

In my work the technic is briefly as follows: The stock culture was isolated from the spleen of a patient with typhoid fever in 1902, so that its attentuation has been considerable. Its killing power with animals is one-fourth that of a similar culture only 1 year old. The organisms grown on agar slants for twenty-four hours, are killed by an exposure to 53 C. in the water-bath for an hour. Standardization is made with the Zeiss blood-platelet counter. Injections are four in number and are given at five-day intervals. The doses, which vary somewhat with the size of the individual, are 100 million, 200 million, 400 million to 600 million. For small women and children the amount of the vaccine is proportional to the body weight.

* Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Vincent: Bull. de l'Acad. de méd., Paris, 1910, No. 24, p. 615.
2. Müller: Ztschr. f. Immunit. u. exper. Therap., 1910, I, Part 5, p. 587.
3. Russynák: Centralbl. f. Bakteriol., 1911, 1 Abt., lviii, 134.
4. Besredka: Ann. de l'Inst. Pasteur, 1902, xvi, 918.
5. Bessau: Centralbl. f. Bakteriol., 1911, 1 Abt., lix, 549.
6. Macfadyen: Brit. Med. Jour., 1903, i, 882.
7. Castellani: Centralbl. f. Bakteriol., 1909, 1 Abt., lii, 92.
8. Pfeiffer and Kolle: Arch. f. Schiffs- u. Tropen-Hyg., 1905, ix, 327.
9. Wright: Brit. Med. Jour., 1897, i, 256.
10. Leishman: Jour. Roy. Med. Corps, 1907, viii, 463.
11. Russell: Johns Hopkins Hosp. Bull., 1910, xxi, 83.
12. Harrison: Jour. Roy. Arm. Med. Corps, 1907, viii, 472; Leishman, etc., ibid., 1908, x, 583, xi, 327.
13. Joslin and Overlander: Boston Med. and Surg. Jour., clvii, 427.
14. Spooner: Am. Jour. of Pub. Hyg., 1909, xix, 616.

The site of injection is preferably in the left interscapular region, but many inoculations have been performed at the insertion of the left deltoid. The latter seems less convenient because of the considerable muscular activity in the neighborhood of the swelling which occurs in almost all instances. Alcohol is used as a local antiseptic. When large numbers are to be inoculated at one time several syringes are used which are boiled between injections, care being taken to cool the syringe before vaccine material is introduced.

REACTION

It is a well-recognized fact that debilitated persons present the most profound reactions, and I have observed that latent and chronic disease of a non-typhoidal character may be made active by an inoculation. I have avoided vaccination in such individuals—especially tuberculous patients, but I have suffered a few accidents through improper histories. In this way a temporary but not serious acute exacerbation has taken place in three patients with chronic arthritis, in a patient with chronic cholecystitis, one with subacute urethritis and in patients with quiescent cases of furunculosis and acne. The duration of these untoward effects was very short.

The safety of my work necessarily calls forth a discussion of the "negative phase" so strongly supported by Wright, Morgenroth and Vincent. Since many of the nurses are exposed to the disease during inoculation a period of diminished resistance would be of great danger. Pfeiffer, Leishman and Russell have shown that the period following injection is one of increased resistance, however. This is in perfect accord with the small morbidity of typhoid among these nurses and eighty others who were most intimately exposed to the disease before and during inoculation. In this light it is interesting and important that few inoculated during the incubation period presented a milder form of the disease than those from whom the infection arose.

The reactions have been reasonably slight. Locally the site of inoculation presents a tender, painful wheal. When a vein is accidentally punctured a more severe local reaction results, the swelling and ecchymosis persisting several days. The neighboring lymphatic glands may become enlarged and tender, but the duration of the latter symptom is short, and the local soreness rarely lasts longer than from twenty-four to thirty-six hours. The constitution reaction in my latest personal cases, some 400 in number, is as follows:

Absent or slight	86 per cent.
Moderate; i. e., malaise, headache and fever not exceeding 100.5 F.	10 per cent.
Severe; i. e., vomiting, diarrhea and chills and fever reaching 102 to 103 F.	4 per cent.

These symptoms last from twelve to twenty-four hours, rarely forty-eight hours. Furthermore, in only five instances has a moderate or severe reaction been produced in any individual by more than one of the four inoculations. Fifty per cent. of the moderate reactions followed the second injection, the first and third dividing the remainder nearly equally. Among the severe reactions 50 per cent were produced by the third, the first and second dividing the remainder. Only very rarely does the fourth inoculation produce any discomfort. I have observed that when inoculation is started on the eve of catamenia or during the early days of flow, constitutional reactions are apt to be more severe. As a result, I plan as far as possible not to have the first two injections fall within those days.

HOSPITAL INOCULATION

During the first year my work was limited to the Massachusetts General Hospital, but since that time inoculations have been performed by me or under my supervision among the nurses and others intimately exposed to the disease in twenty-three hospitals in Massachusetts, through the efforts of Dr. Richardson. In all, 1,585 individuals have received this treatment. The result of hospital inoculations is told in a word by the following tabulation:

Individuals inoculated in hospitals	1,361
Individuals uninoculated (but exposed) in same hospitals	674
Cases of typhoid among the inoculated—excluding 3 who were inoculated during the incubation period (one of these was a paratyphoid infection)	3
Cases of true typhoid among inoculated	2
Cases among the uninoculated (9 of these were paratyphoid cases)	17
Cases of true typhoid among uninoculated	8
Morbidity among inoculated	0.15 per cent.
Morbidity among uninoculated	1.19 per cent.

The last figure is somewhat lower than those of Joslin[13] and myself[14] quoted above. But it shows what may be expected among such large numbers of nurses unprotected by inoculation. The marked reduction among the inoculated needs no further comment. The two cases contracted among the inoculated occurred in the following manner: One nurse, a year following inoculation had attended outside her hospital two typhoid patients who died. Her disease was severe but was followed by recovery. The other, two years after inoculation, while caring for several patients, received in the mouth some typhoid material. Although the mouth was washed with antiseptics a mild infection followed.

In the Massachusetts General Hospital where inoculation has been in progress for three years and where over 80 per cent. of the nurses and others exposed to typhoid have been protected, no cases of typhoid fever have been contracted. Table 1 illustrates exposure in the medical wards during the typhoid season of ninety nurses who had completed their course and ninety-two who were still in training.

TABLE 1.—EXPOSURE OF NURSES IN WARDS DURING TYPHOID SEASON

	Av. Months of Typhoid Duty.	Av. Months of Typhoid Night Duty.	Percentage of Nurses Serving Night Duty During Typhoid Season.
Pupils	2.42	0.54	42
Graduates	2.88	0.64	57
Total	2.64	0.59	44

The high percentage of inoculated nurses serving night duty during the typhoid season is most suggestive, since that class furnishes most of the cases of the contracted disease. In all fairness it must be stated, however, that rather fewer cases of the disease have been treated in the hospital during this three-year period. But this reduction is in no way proportional to the decrease of the incidence above noted.

BLOOD CHANGES

Agglutination reactions have been performed by the microscopic method because of its ease, accuracy and its moderate value. The first hundred cases showed positive

reactions in the following dilutions two weeks following inoculation:

1:50 or greater	80.6 per cent.
1:25 or greater	94.2 per cent.

Macroscopic agglutination reactions at an equal interval show positive results varying between 1:1,000 and 1:10,000. This quality of the blood persists to a considerable degree for two years, but is still evident after two and one-half years.

That an immunity exists in the presence of a positive agglutination reaction of even mild degree is most reasonable. But the converse is not true, since all are familiar with the usual transient character of the antitropic substances of the blood following an attack of the disease itself. Further investigations of blood changes, i. e., bacteriolysins, opsonins, etc., have not been carried out, since those points are now well established.

EPIDEMICS

The employment of this treatment in epidemics has been meager. This has been due no doubt to the fear

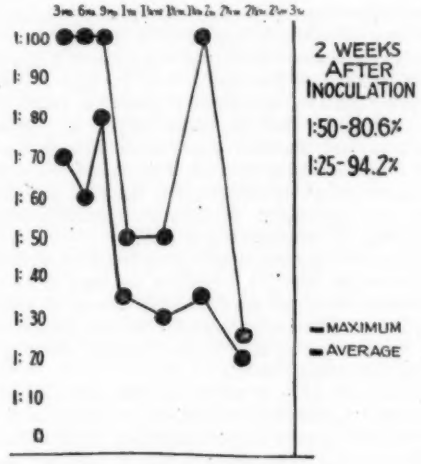

Figure 1.—Microscopic Widals.

of the so-called "negative phase." It has been attempted twice by me. In one instance the infection proved to be paratyphoid, and the results, though interesting, are of no great value. They are as follows:

Morbidity among uninoculated	12 per cent.
Morbidity among inoculated	6.6 per cent.

These figures are somewhat striking since each class embraces an equal number of individuals. Over 80 per cent. were inoculated during the incubation period, a fact which detracts considerably from the value of the statistics. But in spite of this, there is a considerable reduction of morbidity and only two cases appeared after inoculation was completed. Inoculation during this epidemic was of doubtful value.

The second epidemic was of greater interest and the results proved more satisfactory. The water-supply of a limited number of people in a little Vermont village became contaminated with the typhoid organism from the excreta of an isolated individual who had died from the disease six months prior to the epidemic. The original primary cases, seventeen in number, appeared simultaneously (Fig. 2). Within a week twenty-nine of the remaining forty-eight who had been exposed to the disease through the water-supply had been inoculated. Nineteen remained uninoculated. Among the latter five cases developed, among the former one. The latter presented his first symptoms immediately following his first inoculation. His disease was of a very mild variety.

The small size of this epidemic forbids drawing too broad conclusions, but it seems rational to advise the employment of inoculation, since no harm appears to result when the vaccine is given in a judicious manner. Furthermore, the absence of cases contracted among the inoculated in this epidemic and in several isolated cases of immediate exposure seems to be far from a coincidence. Inoculation in the time of epidemics must be performed with care, since it is inevitable that many must be inoculated during the incubation period. The result of this accident is not serious, however. My experience would indicate that the onset of symptoms was hastened by this step, but that the infection was shorter and of a less severe character, possibly because of the destruction of organisms before they had multiplied to a sufficient extent to produce a natural reaction from the unassisted body.

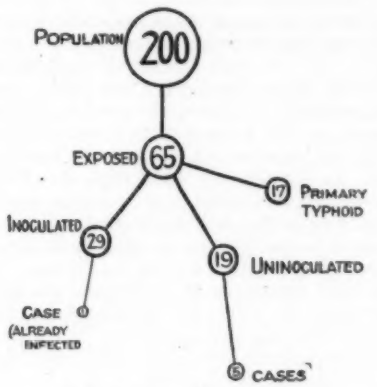

Figure 2.—Greensboro epidemic.

Including this epidemic and other personal cases the final statistics are as follows:

Inoculated individuals	1,585
Uninoculated individuals	700
Cases among inoculated (excepting those mentioned)	2
Cases among uninoculated (with similar exceptions)	13
Morbidity among inoculated	0.12 per cent.
Morbidity among uninoculated	1.86 per cent.

CONCLUSIONS

Frequent injections of small amounts of a low-virulence vaccine cause slight inconvenience.

They seem to produce a protection among nurses, who are eight times more liable to the disease than the average individual.

Their morbidity, under ordinary conditions, is 1.4 per cent, or nineteen cases among 1,361.

Only two cases developed under these conditions.

Case morbidity among the uninoculated in these hospitals is nearly nine times greater than among the inoculated, subjected to similar conditions.

No permanent untoward effects have arisen from over 5,000 injections.

The blood-picture indicates a certain protection lasting at least two and a half years.

The use of this means of protection has been shown to be safe in two epidemics and very efficient in at least one of them.

[NOTE.—I am deeply indebted for their careful work in completing subsequent inoculations and for excellent records of Dr. E. M. Crane, of Hardwick, Vt., and to those physicians in charge of the hospitals in which inoculation has been introduced.]

260 Clarendon Street.

SOME RESULTS AND FIELDS OF USEFULNESS OF ANTITYPHOID VACCINATION *

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Since the results of our campaign against typhoid in Texas have become generally known, there has developed among the medical profession and the laity an active interest in typhoid prophylaxis by means of bacterial vaccines, and for this reason it is believed that a statement of our experience in the army and the present status of the subject may be of value.

To illustrate by comparison I shall refer to vaccination against small-pox, it being the only other measure of this kind which has been extensively used and carefully studied; we know positively that when vaccination against small-pox is thoroughly carried out the disease disappears; we also know that the duration of immunity following vaccinia is not so long as our forefathers believed. In Germany the vaccination of infants is compulsory and revaccinations are required at school age, at the age of compulsory military service and again if there be exposure to the disease, at least three separate vaccinations being required during a lifetime. There is a general belief among the profession and the laity in this country that the immunity conferred by vaccination becomes ineffectual after from seven to ten years. The British royal commission[1] in its final report dated 1896 drew the following conclusions:

> The protection it affords against attacks of the disease is greatest during the years immediately succeeding the operation of vaccination. It is impossible to fix with precision this period of highest protection. Though not in all cases the same, if a period is to be fixed, it might, we think, fairly be said to cover in general a period of nine or ten years. . . . When revaccinated persons were attacked by or died from small-pox the revaccination had for the most part been performed a considerable number of years before the attack. There were very few cases where a short period only had elapsed between the revaccination and the attack of small-pox. This seems to show that it is of importance, in the case of any person specially exposed to the risk of contagion, that they should be revaccinated, and that in the case even of those who have been twice revaccinated with success, if a long interval since the last operation has elapsed, the operation should be repeated, for a third and even a fourth time.

Important further light on the subject is found in an article by Kitasato on "Vaccination and Small-pox in Japan."[2] As Japan is an island kingdom environed by unvaccinated countries in which small-pox is endemic, the disease in a virulent form is frequently introduced. Beginning with the year 1879 elaborate and careful statistics have been collected, which show quite definitely the gradual diminution of the immunity beginning with the second year after vaccination. Kitasato's table, based on 951 cases, is as follows:

SUCCESSFUL REVACCINATION AFTER:

1 year	13.6 per cent.
2 years	32.9 per cent.
3 years	46.6 per cent.
4 years	57.3 per cent.
5 years	51.1 per cent.
6 years	63.8 per cent.

Weil[3] reported in 1899 72.5 per cent. of successful revaccinations after seven years, 80 per cent after eight years, 85 per cent. after nine years and 88.6 per cent. after ten years.

Kitasato concludes that "the immunity acquired through vaccination begins to disappear during the second year, and by the tenth it has almost completely disappeared."

We have, then, some definite facts regarding a successful prophylactic treatment with which to compare vaccination against typhoid fever.

DURATION AND DEGREE OF TYPHOID IMMUNITY

Two questions frequently asked are, "What is the duration of the immunity?" and "Is it absolute?" First, as to its duration: Our own experience, beginning as it does in 1909, is too recent to be of value. From the rich experience of the British army in India Colonel Firth[4] concludes that immunity begins to diminish in about two and one-half years after inoculation. His tables also show that even after four and five years, the maximum period of observation, the rate per thousand among the inoculated is, roughly speaking, only one-fourth that of unprotected troops.

In the early days there was a tendency to consider that this immunity lasted for little more than a year, since agglutinins disappeared from the serum at about this time, but we know that agglutinins are present as long after vaccination as after typhoid fever, which gives, as a rule, protection for life.

As a matter of fact, we do not yet know definitely the duration of immunity following antityphoid vaccination; it begins to diminish at about the same time as immunity to vaccinia and it is possible that it may last nearly if not quite as long.

We know also that the immunity is not absolute, for in 1911, among 80,000 persons vaccinated in the army, there were twelve cases of typhoid with one death (due to intestinal hemorrhage); and in 1910 there occurred six cases among the vaccinated with no fatalities. Had it not been for the prophylactic immunization there would have occurred, at the prevailing rates of incidence, about 250 cases. The fact that the immunity is not absolute is no objection to its use, but is rather an argument for its repetition at intervals to be determined in the future as the lessons of experience become clear, just as we now do in the case of small-pox. It is our present practice to revaccinate against both small-pox and typhoid at the beginning of each three-year period of enlistment.

The failure to secure absolute protection in these few cases may be due to inefficiency of the vaccine, to exposure of the patient to exceptionally large quantities of infectious material or inability of the individual to respond to immunization with the usual antibodies; and this failure can best be interpreted as a personal idiosyncrasy.

* Read in the Symposium on Antityphoid Vaccination in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Article on Vaccination, Encyclo. Britannica, Ed. 11.
2. Kitasato, S.: THE JOURNAL A. M. A., March 25, 1911, p. 889.
3. Weil, quoted by Kitasato (Note 2).
4. Firth: Jour. Roy. Army Med. Corps, 1911, xvi, 589.

With the limited number of doses of vaccine now used we can never hope to raise the immunity high enough to protect against overwhelming doses of infectious material and there are, no doubt, certain persons who cannot be completely protected against typhoid any more than against small-pox. We know that certain horses cannot be profitably used for the production of antitoxin and that not all laboratory animals respond equally to immunization.

Although we may fail in exceptional instances to prevent infection it is probable from our experience that the severity of the disease is modified and the death-rate lowered.

These comparisons prove that in antityphoid vaccination we have a method for the prevention of disease which approaches in efficiency if it does not equal the prevention of small-pox by vaccinia.

USE OF THE TYPHOID PROPHYLACTIC

The vaccine, or typhoid prophylactic, as we style it, consists of a suspension of dead bacilli in salt solution to which is added 0.25 per cent of tricresol as a measure of safety. The vaccine is accurately standardized by counting the bacilli; 500 millions are given as the first dose and 1,000 millions each for the second and third, ten and twenty days later. The skin of the upper arm is sterilized with iodin and the vaccine is injected subcutaneously. There is a local reaction consisting of a small red and tender area lasting about forty-eight hours. The general reaction, when present, gives rise to a headache and malaise and sometimes to fever, chills and occasionally to nausea, vomiting or diarrhea. The severe reactions are exceptional and do not occur in more than from one to three persons per thousand. The occurence of a severe reaction need not give rise to anxiety since they all pass off quickly and leave no trace. We have always insisted that only the healthy should be vaccinated, since a severe reaction in one weakened by disease might do harm. No precautions are taken after vaccination other than to warn against the use of alcoholic drinks and severe exercise. No hard work is required of troops during the following twenty-four hours, but they are not excused from ordinary routine work, as a rule. At one recruit depot during the past ten months 6,690 men have been vaccinated three times, making over 20,000 vaccinations; and only 223 men were excused from duty as a result, or about one in ninety; this record is probably higher than would occur were it not for our custom of vaccinating simultaneously against small-pox on one arm and against typhoid on the other. If the vaccinia is severe, the second dose of antityphoid vaccine is postponed a few days, but it has not been necessary to deviate in any other way from this routine.

RESULTS OF ANTITYPHOID VACCINATION

The total number of doses of our vaccine which have been used up to the present time is over 400,000, and no bad results have been reported; thanks to the efficiency of iodin as an antiseptic and the presence of 0.25 per cent. tricresol in the vaccine there have been no skin infections. We have always insisted that the dose be given subcutaneously and never into the muscle, since slow rather than rapid absorption is desired. In such a large number of hypodermic injections one might expect some accidental complications, yet only one has been reported, a case of temporary musculospiral neuritis. It is well to remember, however, that none but healthy persons should be immunized with the dosage used by us; by diminishing the quantity and increasing the number of doses it should be possible to immunize almost any one regardless of age or health. The present dose is arranged for a healthy man weighing 150 pounds, and is diminished for women and children in proportion to their weight.

The value of the protection given against typhoid fever can best be shown by stating briefly the results obtained at San Antonio and along the Mexican frontier during the spring and summer of 1911, and by contrasting these figures with the records of the Spanish War.

A division of troops, about 20,000 men, was mobilized in Texas and along our southern boundary as far west as San Diego, Cal., in March, 1911; they remained in camp and on march for a period of over four months; then the majority returned to permanent army posts. Immediately on the receipt of orders for mobilization the Surgeon-General made arrangements for compulsory vaccination of the entire command, with the exception of a few persons over 45 years of age. The vaccine was prepared at the Army Medical School, and sent forward as rapidly as it could be used. The immunization was carried out after the troops arrived at their destination and while they were under canvas without interfering with their work. As a result we have to record only two cases of typhoid, one in Texas and one in California, both ending in recovery, in the entire number of troops in the field.

In 1898, during the Spanish War, there were assembled at Jacksonville 10,759 troops among whom there were certainly 1,729 cases of typhoid, and including those probably typhoid, 2,693 cases, with 248 deaths. This camp lasted approximately as long as that at San Antonio; the number of men was less by about 2,000; the camps were situated in about the same latitude and both were furnished artesian well water; yet in 1898 there were over 2,000 cases and 248 deaths and in 1911 there was one mild case. We know that this immunity was not due to lack of exposure since the fever prevailed to a considerable extent in and around San Antonio. To be sure, our camps were more hygienic and sanitary than any we have ever had before, and the sick-rate from all causes was low, yet the men were permitted to visit town, where they became, for the time, a part of the community and were exposed to the usual sources of infection; yet there was almost complete absence of typhoid fever. This circumstance should leave no doubt of the value of antityphoid vaccination, since it is apparent that perfect camp sanitation cannot explain the immunity enjoyed by those who left camp. It is highly probable that there were also a few chronic bacillus-carriers among our own men, yet owing to vaccination and the excellent sanitation of the camps, the men remained healthy. Protection of the individual by vaccination is the only measure of protection independent of surroundings and effective under all conditions.

Compulsory vaccination in the southern maneuver camp was ordered March 9; the order was made applicable to all recruits for the army June 9, 1911, and was extended to include the entire personnel of the army under 45 years of age, Sept. 30, 1911. It follows that the number of men vaccinated increased by leaps and bounds; at the commencement of the year not more than 15,000 had been immunized while at the end there were over 55,000. If vaccination gives the protection which we believe it does, it should show in the total number of cases occurring during 1911, and the accompanying table has been prepared to show the statistics for the past four years. In considering this table it is well to

remember that 1911 was a year of unusually great exposure, due to an extraordinary amount of field service.

DECREASE IN TYPHOID FOLLOWING ANTITYPHOID VACCINATION

	Cases		Deaths		Vaccinated Persons	
Year.	No.	Ratio per 1,000 Mean Strength.	No.	Ratio per 1,000 Mean Strength.	Cases.	Deaths.
1901	552	6.74	72	.88	..	..
1902	565	6.99	69	.85	..	..
1903	348	5.14	30	.44	..	..
1904	280	4.77	20	.33	..	..
1905	193	3.39	17	.29	..	..
1906	347	6.15	15	.26	..	..
1907	208	3.87	16	.29	..	..
1908	239	3.20	24	.31	0	..
1909	282	3.35	22	.26	0	..
1910	198	2.43	14	.17	0	..
1911	68	0.82	8	.097	12	1
1912*	7	0.20	1	.003	3	0

* Ratio for 1912 based on experiments for first half year.

For the present year, 1912, there have been reported during the first six months, seven cases, only three of which were in immunized persons; two of the remaining four developed in recruits within two weeks of the date of their entry into the service; should this rate continue we should not expect more than fifteen or twenty cases during the entire year.

The statement of these three results: those obtained in the Southern Maneuver Division, in the whole army in 1911, and in the first four months of 1912, should convince any one of the high protective value of this form of prophylaxis. Excellent results have been obtained in the past, particularly by the British in India, yet as the measure was to a certain extent a voluntary one, the objection has been made that the statistics conveyed a false impression as to its value, since the men who volunteered, being careful and thoughtful individuals, would probably not have contracted the disease in any event. This objection we have disposed of in our service by making the vaccination obligatory on every person under the control of the commanding general. In fact, it is difficult to conceive of a more complete and thorough-going test of any measure than has been given this, and the results are evident.

FEASIBILITY OF GENERAL INOCULATION

A word as to the necessity for this form of prophylaxis. It is generally admittd by the opponents and more numerous luke-warm adherents of antityphoid vaccination, that it is essential for the Army and the militia of the several states, in times of war and mobilization. Has it not, however, a field of usefulness in civil life in this country? It has been repeatedly shown that the incidence of typhoid fever is higher in hospitals than in the cities in which the hospitals are situated,[5] and there is pretty general agreement that the medical and nursing staffs and employees should be vaccinated. For the same reason all who in any way come in contact with the sick should be immunized, since typhoid, like other exanthems, is contagious during the prodromal stage.[6] In this group we may place the personnel of dispensaries, various charities and undertakers.

Another large group comprises those who live in industrial villages, mining towns, isolated communities where the typhoid death-rate is above the average. Workhouses, asylums and especially schools come in this category.

There is another large group of persons living under conditions simulating those occurring with an army in the field, although without the same sanitary safeguards. I refer to the camps of engineers, contractors and pleasure seekers. Here, if anywhere, the use of the typhoid prophylactic would richly repay the time and trouble necessary for its administration. Its usefulness, however, is not limited to these classes of persons. The typhoid death-rates for New York, Boston, Chicago and most other large cities in the North are low, varying from 4.7 in Bridgeport, Conn., to 17.5 in Philadelphia, and as long as the inhabitants of these cities remain at home they run little danger of contracting the disease. Remaining at home, however, is a thing most of us do not do; we send our patients, families and go ourselves to the seaside and mountains where the typhoid rate is five and ten times as high as at home. In the cities we depend on pure water, proper disposal of wastes and the intelligent activities of an energetic municipal health department. In going into the country or traveling from place to place where the usual safeguards are lacking, why not avail ourselves of this form of individual prophylaxis which is efficient in all places and at all times?

5. Richardson and Spooner: Boston Med. and Surg. Jour., 1911, clxiv, 8.
6. Conradi: Klin. Jahrb., 1907, xvii, 297

INOCULATION AGAINST TYPHOID

IN PUBLIC INSTITUTIONS AND IN CIVIL COMMUNITIES: A FURTHER REPORT*

F. W. HACHTEL, M.D., AND H. W. STONER, M.D.

BALTIMORE

Since the experimental inoculations of Wright[1] and of Pfeiffer and Kolle,[2] in 1896, immunization against typhoid fever not only has been tested out in various armies and proved of inestimable value in reducing the number of cases of this disease in military camps, but also has been used in hospitals to lower the attack-rate among nurses and attendants. More recently, even certain state and city boards of health have adopted this procedure in their fight against typhoid.

The utility of this measure in military life is settled beyond debate, while its usefulness in protecting those exposed to infection in hospitals cannot be disputed. Indeed, it is our belief that the time is not far distant when those in charge of such institutions not offering this means of protection to their nurses and attendants will be considered culpably careless.

Again, it is our firm conviction, based on results we have obtained, that inoculation against typhoid is adaptable to preventing epidemic and sporadic cases in public institutions, particularly those for the insane and feebleminded.

The advisability of extending typhoid vaccination to civil communities at large, however, may be considered an open question. It might be argued that the various measures now used in the war against enteric fever are all that are essential; that if cities and towns direct their attention to obtaining pure water, clean milk, the proper disposal of sewage, and freedom from flies; if shell-fish and green vegetables are obtained from sources above the suspicion of pollution; and if reports of all cases of typhoid fever are followed by placarding the houses, screening the patients and disinfecting the excreta, bed-

* Read in the Symposium on Anti-Typhoid Inoculation in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

* From the Bacteriologic Laboratory of State and City Boards of Health.

1. Wright: Lancet, London, Sept. 19, 1896.
2. Pfeiffer and Kolle: Deutsch. med. Wchnschr., 1896, xxii, 735.

ding and utensils likely to be contaminated by such excreta, it will be unnecessary to add typhoid vaccine to their armamentarium.

Such a position, however, seems little more tenable than to hold that they should direct their attention to the proper disinfection of the dejecta to the exclusion of all other means of prevention. For our large cities, much less our smaller towns, have not attained, and in the near future are not likely to attain, this advanced state of sanitary control over the above-mentioned carriers of infection. In the meantime are they content to remain supine and to allow the annual sacrifice without offering their poorer citizens this method of prophylaxis, and without at least advising its adoption by those citizens who can afford to do so? Again, even in a community in which this ideal of sanitation is an accomplished fact there would still be the bacillus-carrier, the contact case and the danger of introduction from without either by visitors or by residents.

When all things are considered we feel that there is a field for antityphoid inoculation in the prevention of enteric fever in civil life, and that those state and city boards of health that are supplying vaccine to the citizens of their respective states and cities are acting wisely.

For more than two years the department of health of Baltimore has furnished vaccine to the various hospitals within the city, and it has recently decided to give it free to citizens who are unable to purchase it. The state department of health of Maryland since the summer of 1911 has prepared antityphoid vaccine for several state institutions. Altogether, since March, 1910, between 2,700 and 2,800 persons have been inoculated with vaccine from the conjoint laboratory of the state and city boards of health, and reports have been obtained from 2,044 of these, we ourselves having immunized only 140 of this number.

The immunization of 650 of the 2,700 and odd has not been completed, so that no report of the reactions can be made at present. This includes 250 citizens of a town of 6,000 inhabitants, in which there are certain districts showing an excessive attack-rate. The other 400 are inmates of Springfield State Hospital. In addition to these the inoculation of volunteers from the unvaccinated members of the Fourth Infantry, Maryland National Guard, is in progress. The number of these is at present not ascertainable.

Of the total number of those from whom we have procured records, 309 were resident physicians, nurses and attendants in general hospitals; 1,551 were inmates, nurses and attendants in two state hospitals for the insane, and 184 were private citizens of Baltimore and of rural districts. This latter class includes physicians, nurses in private practice, medical students, commercial travelers, laboratory workers, members of infected households and people going to summer resorts; in short, persons specially exposed to infection.

Table 1 shows in detail the distribution of the 2,044 persons from whom reports have been obtained.

Before analyzing the reports thus far received we shall briefly describe the preparation of the vaccine employed. This has been prepared in two different ways. At first it was made from a mixture of six different strains of *Bacillus typhosus*, five of which had recently been isolated from blood-cultures. The other bacillus had been under cultivation in the laboratory for several years. These six organisms were inoculated into a flask containing 100 c.c. of broth incubated from eighteen to twenty-four hours, and from this mixed growth agar-cultures were made. At the end of twenty-four hours the latter were washed off with sterile normal salt solution, and the bacilli were killed by holding the suspension at 58 C. for forty-five minutes. This was then preserved by adding 0.25 per cent. of tricresol. From the beginning of 1911 to the present time the vaccine has been prepared from a typhoid bacillus furnished us through the courtesy of Major Russell, this being the same avirulent strain with which the Army has been immunized. In the preparation of the vaccine from this bacillus it has been our custom to kill the organism by the use of 0.5 per cent. phenol (carbolic acid). In the main the various stocks of vaccine were standardized by Wright's method. Occasionally, however, Harrison's modification of this method was employed. Before distribution the death of the typhoid bacillus and the freedom from contamination were determined by making aerobic and anaerobic cultures. As a further safeguard white mice and guinea-pigs were inoculated.

The injections were made subcutaneously into the arm near the insertion of the deltoid. At first the site of inoculation was prepared by rubbing briskly with 95 per cent. alcohol, but a little later a solution of phenol or mercuric chlorid was substituted for this. Since the summer of 1911 we have advised the thorough cleansing of the arm and the application of tincture of iodin round the point of insertion of the needle both before and after the inoculation.

TABLE 1.—DISTRIBUTION OF PERSONS INOCULATED FROM WHOM REPORTS HAVE BEEN OBTAINED

Springfield State Hospital, inoculated under the direction of Dr. J. Clement Clark, 1911	887
Spring Grove Hospital, inoculated under the direction of Dr. J. Percy Wade, 1911	664
Mercy Hospital, inoculated under the direction of Dr. Eckhart, 1910	68
Mercy Hospital, inoculated under the direction of Dr. Gillis, 1912	25
Franklin Square Hospital, inoculated under the direction of Dr. Pearce Kintzing, 1910	16
Franklin Square Hospital, inoculated under the direction of Dr. Pearce Kintzing, 1912	11
University Hospital, inoculated under the direction of Dr. H. J. Maldeis, 1911	88
University Hospital, inoculated under the direction of Dr. H. J. Maldeis, 1912	18
St. Joseph's Hospital, inoculated under the direction of Dr. E. H. Hayward, 1911	34
Homeopathic Hospital, inoculated under the direction of Dr. H. M. Stevenson, 1911	11
St. Agnes Hospital, inoculated under the direction of Dr. J. A. Chatard, 1911	38
Private cases, inoculated under the direction of numerous physicians, 1911-1912	44
Civilians (including physicians, nurses, students, etc.), inoculated by the authors, 1911-1912	140
	2,044

The doses employed have been increased since we first started. We felt that if we were going to succeed in having antityphoid vaccine generally adopted by hospitals and institutions it was necessary at first to avoid any unduly severe reactions; we therefore began with the administration of 125 million, 250 million and 500 million dead typhoid bacilli at intervals of from seven to ten days. Later when this preventive measure became more firmly established in these institutions, we felt it was both safe and wise to increase the doses to 250 million, 500 million and 1,000 million bacilli, to be given at intervals of a week to ten days. We did not advise this, however, until these doses had been tried on students who had volunteered, and it was found that there was little or no perceptible increase in the severity of the reaction.

We have a record of the ages of 1,326 of those immunized: fourteen were in the second decade of life; 367

† Since this paper was read the distribution of vaccine has been extended to all citizens.

were in the third decade; 943 were in the fourth, and two were in the sixth. Of those between 10 and 20 years of age eleven were nurses in training, and eight of these gave a moderately severe reaction, certainly an inordinate number; the other three in the second decade were students, and these escaped without any systemic disturbance. There is no noticeable difference in the severity of the reaction to the vaccine for the other periods of life.

On analyzing the records we find that redness and local tenderness were present in all cases, but infection never ensued. Malaise followed the inoculation in 775 cases; headache in 835; muscular pains in 106; nausea and vomiting in sixty; chills in fifty-seven and rise of temperature in 884 cases. In 1,160, or 56.7 per cent., constitutional symptoms failed to follow the injections.

As already mentioned, 1,160, or 56.7 per cent., of those immunized did not develop fever. The temperature ranged from normal to 101 F. in 785, or 38.4 per cent., of the cases; from 101 F. to 103 F. in eighty-two, or 4 per cent.; and in the remaining seventeen, or 0.8 per cent., it exceeded 103 F.

Of the 884 showing constitutional reaction 874 state the inoculation which this followed. The analysis of these 874 records discloses that the reaction occurred after the first injection only in 132 persons; after the second only in 255; after the third alone in 382; after the first and second in fifty-nine; the second and third in fourteen; the first and third in ten; and all three in twenty-two cases. From these figures Table 2 has been constructed.

TABLE 2.—STATEMENT OF INOCULATIONS WHICH WERE FOLLOWED BY CONSTITUTIONAL REACTIONS

Dose	Number of Records	Number Showing Systemic Reaction	Per Cent.
First alone	2,044	132	6.4
Second alone	2,044	255	12.4
Third alone	2,044	382	18.6
First and second	2,044	59	2.8
Second and third	2,044	14	0.6
First and third	2,044	10	0.4
First, second and third	2,044	22	1.0
Not noted	2,044	10	0.4

Table 3 shows the percentage of reactions following each dose.

TABLE 3—PERCENTAGE OF REACTIONS FOLLOWING EACH DOSE

Dose	Number of Records	Number Showing Systemic Reaction	Per Cent.
First	2,044	223	10.9
Second	2,044	350	17.1
Third	2,044	428	20.9

In 246 of the 884 having a systemic reaction this lasted from one to six hours in fourteen cases; it persisted from six to twelve hours in ninety-six; it disappeared in from twelve to twenty-four hours in eighty-nine; from one to two days in forty-three; from two to three days in five; from three to four days in six instances; in five days in one; and it lasted over ten days in two persons. One of these, a female patient at Springfield Hospital, was suffering from chronic mania. In this case a low grade of temperature persisted for two weeks and pulmonary tuberculosis was suspected; and while no sputum could be obtained for examination for the tubercle bacillus, the patient had a dry, hacking cough and dulness over a portion of one lung. The other patient was an extremely hysterical woman. She suffered from gastric distress for ten days after the inoculation. She, however, has had similar attacks before and since that time. In another institution two tuberculous persons were vaccinated; one of these reacted with moderate severity, the other but very slightly.

Although the number of patients inoculated with the polyvalent vaccine has been comparatively small, we have drawn up a table comparing the reactions following the use of this with those resulting from the use of that prepared from the Russell strain. These are shown in Table 4.

TABLE 4.—COMPARISON OF REACTIONS FOLLOWING INOCULATIONS OF POLYVALENT VACCINE AND MONOVALENT VACCINE OF THE RUSSELL STRAIN

Reaction	Polyvalent Vaccine		Monovalent Vaccine	
	Number	Percentage	Number	Percentage
No reaction	56	56.5	1,104	56.7
Slight (temperature normal, 101 F.)	24	24.2	761	39.1
Moderately severe (temperature 101-103 F.)	16	16.1	66	3.3
Severe (temperature over 103 F.)	3	3.0	14	0.7

This shows that in more than half the cases no reaction ensued after the use of either type of vaccine. In addition, we find that 95.8 per cent. of persons immunized with the single avirulent strain had either no elevation of temperature or a rise to less than 101 F., while but 80.7 per cent. of those receiving the other vaccine had a like result; moderately severe and severe reactions, therefore, more frequently occurred after the administration of the polyvalent type.

We feel, nevertheless, that no conclusions should be drawn from this comparative table, since they would be invalidated by the small number of persons that have been immunized with the polyvalent as compared with those protected with the monovalent vaccine. We believe, however, that one prepared from a number of strains of avirulent typhoid bacilli would subserve its purpose better than a vaccine made from a single strain. These organisms should be carefully selected; only those capable of producing large quantities of antibodies and at the same time not causing severe general disturbances should be used.

As already mentioned, we have increased the dosage of vaccine since the spring of 1911. In order to compare the reactions following the larger and smaller doses we have carefully gone over the reports received. The first inoculations with the increased doses were made into medical students, and as there was scarcely any increase in the severity of the reactions we have since then used them in the immunization of all adults.

In making the comparison we have included only the cases of patients inoculated with the monovalent vaccine. This has been done because those injected with the other invariably received the smaller doses, and we therefore believe it is only fair to omit these altogether.

The examination of the records of those immunized with the single avirulent strain shows that 635 persons received 125 million, 250 million and 500 million, and 310 were given 250 million, 500 million and 1,000 mil-

lion dead typhoid bacilli. Of the former 58.4 per cent. escaped without a general reaction; 39 per cent. had but a slight one; 1.8 per cent. suffered a moderately severe one; and 0.6 per cent. had a severe reaction. Of the latter 47.7 per cent. had no systemic symptoms; 39.3 per cent. reacted but slightly; 11.6 per cent. had a moderately severe, and 1.2 per cent. a severe reaction. Thus we find that 97.4 per cent. of those injected with the smaller doses showed either no constitutional disturbance or but a slight one, while only 87 per cent. of those receiving the larger quantities had a similar experience. Despite the somewhat larger proportion of moderately severe reactions we believe the use of the bigger doses is more than warranted by the greater protection that must almost certainly ensue.

Of the 310 injected with the larger amount 187 were nurses in hospitals, and it has been our experience that they show a disproportionate number of moderately severe and severe reactions. The fact, therefore, that so large a percentage of these cases was of this class explains to a great extent the differences noted above. Table 5 shows these differences in a striking manner.

TABLE 5.—COMPARISON SHOWING GREATER REACTION IN NURSES

Dose	No Reaction		Slight Reaction		Moderate Reaction		Severe Reaction	
	No.	Per Cent.	No.	Per Cent.	No.	Per Cent.	No.	Per Cent.
125, 250 and 500 million	956	58.4	639	39.0	30	1.8	10	0.6
250, 500 and 1,000 million	148	47.7	122	39.3	36	11.6	4	1.2
125, 250 and 500 million (nurses alone)	3	7.9	30	79.9	3	7.9	2	5.2
250, 500 and 1,000 million (nurses alone)	68	36.3	89	47.6	26	13.9	4	2.1
125, 250 and 500 million (nurses excluded)	953	59.6	609	38.1	27	1.7	8	0.5
250, 500 and 1,000 million (nurses excluded)	80	65.0	33	26.8	10	8.1	0	0.0

As for more than two years antityphoid vaccine has been distributed by the conjoint laboratory of the state and city boards of health, we deem it important to tabulate the immunized cases according to the time that has since elapsed (Table 6).

TABLE 6.—CASES IMMUNIZED SINCE VACCINE HAS BEEN DISTRIBUTED

	Hospital Nurses and Attendants	Inmates Public Institutions	Civilians	Total	Typhoid Among Immunized
2-2½ years ..	84	0	15	99	0
1-1½ years ..	0	0	56	56	0
1 year	171	887	36	1,094	0
9 mos.-1 yr...	0	330	0	330	0
6-9 months...	0	334	18	352	0
3-6 months...	11	0	55	66	0
1-3 months...	43	0	4	47	0
Total.....	309	1,551	184	2,044	0

Besides giving the length of time the various classes of people have been inoculated this table also shows that none of the immunized have developed typhoid. This latter fact is of peculiar interest when it is seen that the persons vaccinated have largely been those especially exposed to infection.

Thus, 309 were nurses and attendants in general hospitals in a city in which typhoid is very prevalent. Now Joslin and Overlander[3] found that the attack-rate for nurses in six Boston hospitals for the years 1902 to 1905 was 161 per 10,000 as compared with twenty per 10,000, which was approximately the morbidity for the whole of Massachusetts. Again, as previously noted by Hachtel and Stoner,[4] for the five years preceding the adoption of this prophylactic measure the attack-rate for nurses and attendants in six Baltimore hospitals was about 500 per 10,000. Since in the city at large the number of cases for the same years has ranged from 24.5 to 42.2 per 10,000 inhabitants;[5] therefore, in these hospitals the nurses and attendants appear to be about twelve to twenty times as liable to infection with enteric fever as the citizens of Baltimore. As before stated, the attack-rate before immunization was instituted was 5 per cent., while that for vaccinated nurses and attendants has been *nil*. Add to this that in five of these same institutions eighty-two nurses were not injected, and seven of these, or 8.5 per cent., contracted typhoid, and we have a most striking comparison.

Then again, 887 of the vaccinated were inmates and employees of an institution for the insane, principally the former. In this asylum the morbidity from enteric fever for the previous years was 1 per cent. a year. Now while not one of the inoculated developed this disease, three out of 333 not immunized suffered from typhoid.

Still further, the 184 civilians were persons particularly subjected to infection, such as physicians, nurses in private practice, laboratory workers, medical students and traveling salesmen. Besides this, eleven of these were members of infected households, and in several instances either nursed or assisted in the nursing of the patient.

In conclusion, we are convinced that antityphoid vaccination is of incalculable value in the protection against enteric fever, and owing to the undue incidence of this disease in hospital nurses and attendants, they should be urged to submit to inoculation. Indeed, we feel that the authorities in control of such institutions who do not offer their nurses this protective measure are negligent in the extreme. In public institutions, especially in hospitals for the insane and mentally deficient, inoculation should be employed in reducing the number of cases of this malady. In the latter hospitals great care should be exercised as to the selection of patients for immunization, avoiding those of advanced years and those suffering from chronic organic disturbances such as arteriosclerosis and cardiac and renal diseases.

Considering the brilliant results obtained, the very slight inconvenience usually experienced following the vaccination, the atrocious number of cases of typhoid fever occurring yearly in both the city and the country, and the extreme complexity of the problem of lessening this attack-rate by sanitation, it is our firm conviction that all civilians should be advised to be inoculated against this disease. Naturally we do not advise antityphoid vaccination as a substitute for proper sanitary control. When we think of the extreme difficulty of coping with typhoid, however, and the length of time it will require to attain the ideal of sanitation; when we consider that even under the best sanitary conditions we

3. Joslin and Overlander: Boston Med. and Surg. Jour., civii, 247.

4. Hachtel and Stoner: Am. Jour. Pub. Health, ii, No. 3, p. 157.

5. As the report of typhoid cases in Baltimore is not complete, these figures are estimated from the reported deaths on a basis of a 10 per cent. fatality.

still have to fear the typhoid carrier, direct contact and the danger of introduction from without by visitors and by citizens, we believe that antityphoid inoculation will have a place in the prevention of this disease in civil life, and that boards of health should not only advise the adoption of this measure, but should also distribute the vaccine free of charge for the immunization of the citizens of their respective communities.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SPOONER, RUSSELL AND HACHTEL AND STONER

DR. M. P. RAVENEL, Madison, Wis.: The State Hygienic Laboratory of Wisconsin began issuing antityphoid vaccine free of charge to physicians of the state about nine months ago. Our experience is that inoculation into the arm as recommended in the Army produces less reaction than in other parts of the body. I wish to confirm what Dr. Spooner has said about the mildness of the attack in those who have been partially vaccinated or in whom infection has already taken place when the vaccination was done. We have had several cases which confirm this statement. We have urged strongly the vaccination of nurses in hospitals throughout Wisconsin and it is being done to a considerable extent. The following case is of interest: A woman was suffering from typhoid fever. The attending physician wished to vaccinate the husband and two trained nurses in charge. We sent the vaccine. One nurse, however, refused the vaccination, saying that she was immune. Soon after leaving the case she was taken sick with typhoid. The husband and the other nurse remained well.

We have vaccinated about 1,900 people in Wisconsin, including approximately 1,000 of the National Guard. The reactions have been almost invariably mild. Two severe reactions occurred on the third injection which were hard to explain. Inquiries showed that both men had been drinking. Our experience, though comparatively small, has convinced us of the great value of the process. In one institution we apparently stopped a bad outbreak at once. In a small town where typhoid was raging we vaccinated 116 persons. We have not had the report of a single case occurring in any of those vaccinated. We are using a polyvalent vaccine, and are urging on the physicians of the state the further adoption of the practice.

DR. MALCOLM C. ROSE, New York: It is a great thing when a physician can say that he has had this preventive treatment himself; perhaps Major Russell and Dr. Spooner have had it; I would like to know their personal experience and learn just how it feels, because the next trip of the American Medical Association will probably be away to the West—we shall have to travel on cars, boats and other means of transportation where we shall be exposed. Dr. Spooner speaks about the severe reaction; but exactly what he saw I am not quite sure. Then, also, how long does this immunization last?

Does vaccination help to prevent relapse when a typhoid patient is vaccinated in the home? Does it help to prevent relapse, or what some doctors call a relapse, when it is a new running of the disease? I call a relapse the result of improper care or improper feeding.

DR. LESLEY H. SPOONER, Boston: I have not used the interscapular region for a long time. I have inoculated only 500 in the back; but I have been impressed by the fact that the circumference of induration was not so great nor complaints so frequent as when other regions were employed. There is one thing to be said, however, in limitation of that statement: those persons who have been inoculated in the back have been chiefly private patients. I find that in the latter class less severe reactions are met than among nurses and physicians. This may account for the discrepancy in our findings.

An episode connected with the little epidemic which I have described before parallels Dr. Ravenel's experience of similar exposure to the two nurses engaged on the same case. Two table girls were employed at the hotel which was the hotbed of this epidemic, since about half the cases originated there. These girls were doing exactly the same work; they shared the same room and slept in the same bed. One was inoculated, the other was not. The former had the most severe reaction of any one in that group of cases. She did not contract the disease. Two weeks after the last inoculation, the uninoculated table girl contracted the disease. In regard to personal inconvenience, I will say that I inoculated myself twice and was given the third injection by a confrère three years ago. On only one occasion did I feel any constitutional reaction. It consisted of such symptoms as one expects on the eve of a cold. The following day they had entirely disappeared. There was, as I recall, slight local soreness. I felt nothing to prejudice one the least against undergoing the treatment.

DR. F. F. RUSSELL, Washington, D. C.: Since we do not know accurately the duration of the immunity, we recommend revaccination of soldiers once in each enlistment, giving two doses on the second vaccination, rather than three. Among civilians we suggest revaccination only on exposure. It is important to refuse vaccination of persons who are not well. Our refusal to vaccinate all but the healthy may explain our good results and complete lack of accidental complications. Many are using polyvalent vaccines with the idea that they are better than vaccines made from a single strain of the bacillus. We have always used a single, selected strain, which confers protection wherever used. There is more reason for adding a little paratyphoid to the vaccine. At present we do not know how prevalent paratyphoid fever is; we are encouraging our men to use blood-culture methods, that this point may be accurately known.

The importance of Dr. Spooner's work in the Greensboro epidemic and of vaccinating the nurses while on duty in the hospital is great. It is a different problem from ours. At Torrington, Conn., last summer, vaccine was used extensively in an epidemic; there was only one case among the vaccinated, and that a mild one. I do not remember the total number of cases, but eighty nurses were employed, of whom forty-five accepted and thirty-five refused vaccination. Among the forty-five there were no cases, while three occurred among the thirty-five unvaccinated. Vaccine was used in a small epidemic among 2,500 marines at Guantanamo, Cuba. In the one case in which typhoid developed after vaccination, autopsy showed that the patient was undoubtedly infected before. Wright and Leishman used vaccine during the height of an epidemic at Maidstone, England, with excellent results. Cullison, a pupil of Wright, vaccinated the attendants and nurses of an insane asylum in Dublin, during an epidemic, with the same good results. The vaccine was used the past year in an epidemic in Cedar Rapids, Iowa, where the outcome was also satisfactory. Dr. Spooner's paper again emphasizes the fact that we need have no fear of an injurious negative phase; that we can safely vaccinate against typhoid just as we do against small-pox.

It seems probable that the way in which the vaccination is done has something to do with the severity of the reaction. The absorption of vaccine should be as slow as possible. We think it should be put into the subcutaneous tissue, and not into the muscle; some men have vaccinated directly into the muscle, where the absorption is too rapid, producing a decided reaction. If the second or third dose is injected into a region still indurated from a previous inoculation there may be rapid absorption, with severe reaction.

DR. HARRY W. STONER, Baltimore: Several striking instances occurred in our experience with the vaccine: In one institution eighty-eight out of ninety-one nurses and attendants were inoculated in 1911. One of the three nurses not inoculated developed typhoid fever and died. At another hospital a nurse who was on her vacation at the time the inoculations were made was not immunized. A few weeks after she returned to the hospital she developed typhoid. In still another institution in which the nurses were immunized in 1910, three out of eight new nurses who came in in 1911, and who had not received the vaccine, were stricken with typhoid fever during the latter part of that year, while none of the inoculated nurses remaining in the hospital were attacked.

The question how long immunity lasts is a pertinent one and not easily answered. From studies we have made with the serum of rabbits inoculated with typhoid vaccine, we have found a gradual rise in the bacteriotropic substances—bacteriolysins, agglutinins and opsonins—corresponding closely, and following about the same curve as that occurring in human beings. These substances were demonstrable in the blood for from six months to a year, gradually decreasing until they finally disappeared. When these animals were reinoculated with similar doses of the same vaccine it was found that there was a much quicker production of these substances than at first. We believe that the first inoculation sensitized certain cells, which on reinoculation responded more readily to the production of these substances, and that a person immunized by typhoid vaccine is protected from typhoid by the rapid formation of these antibodies. Since the curve of the formation and duration of these bacteriotropic substances in the blood of immunized individuals corresponds closely with their production and durations in the blood of patients with typhoid fever, it would seem that an immunized individual would be as well protected as is the individual who has had typhoid fever.

As to personal experience, Dr. Hachtel and myself were the first in our series of cases to receive the vaccine. Neither of us suffered any great reaction. Following the second injection I had a slight rise in temperature and a dull headache lasting about two hours. The other two injections did not give rise to any symptoms.

A STUDY OF THE ULTIMATE RESULTS IN THE DISPENSARY TREATMENT OF TUBERCULOSIS*

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PHILADELPHIA

Without the dispensary, such control as we now have of the tuberculosis problem would have been hardly possible. Its importance in the tuberculosis crusade cannot be overestimated, and yet it is extremely difficult to establish in terms of cases with disease arrested just how efficient it really is. Compared with statistics dealing with sanatorium patients, there are few statistics to show the ultimate results obtained in patients whose treatment was received entirely in a dispensary. When the tuberculosis dispensaries were first introduced it was hoped and believed that the majority of patients could be treated efficiently by these agencies. After a few years' trial, however, there was considerable disappointment with the results obtained, and with the increasing number of sanatoriums more and more cases were at once sent to these institutions. Here, again, the results have not measured up to expectations, so that at present there is considerable uncertainty in regard to the best way to proceed.

In the meantime, dispensary treatment itself has undergone many changes and in each instance for the better. The lesson has been learned that there is a limit to the number of cases which can be handled efficiently; supervision in the home has been made something more than a mere inspection visit, and above all, there has come about a very general appreciation that there are economic and social as well as medical aspects of the tuberculosis problem.

It is particularly the economic and social aspects of the problem that have emphasized the need of redoubling our efforts along the line first attempted by the dispensary, namely, the handling in their homes of patients who appear to have a chance of being benefited. This involves the improvement or the attempt at improvement of living conditions, without which no very rapid improvement in the situation can be hoped for. From this point of view the experiments about to be inaugurated in New York City and Cincinnati, whereby the problem is attacked as a family problem in the home, will be watched with the keenest interest.

It should be borne in mind that the results detailed in this paper represent the dispensary as it was in its incipient state. Furthermore, the Phipps Institute dispensary, at the time of its foundation, was the only place of its kind in eastern Pennsylvania, and to it flocked patients from all over Philadelphia, the adjoining towns and even the neighboring State of New Jersey. Of necessity, supervision was impossible in many instances and even where practiced, inadequate, as we understand supervision to-day.

The patients under consideration visited the Phipps Institute in the second year of its existence; namely, from Feb. 1, 1904, to Feb. 1, 1905. The investigation was completed Sept. 1, 1911, so that an interval of nearly seven years had elapsed. Any one who has not attempted an investigation of this sort can hardly appreciate the difficulties encountered in such a study. The long interval which had elapsed and the constant shifting of their abode on the part of many of the patients made the obtaining of information a slow and tedious process. One of the gratifying results, however, was the receipt of many letters, which indicated that the instructions received had been productive of good.

The total number of patients applying to the Institute in the year under consideration was 1,067. They have been divided into four groups: first, those known to be dead; second, those untraced; third, those refused treatment, because of being either not tuberculous or not destitute; and fourth, those known to be living. The information was obtained from the records of the institute, the official death records at the City Hall, from letters and from the investigations of a nurse.

I. PATIENTS KNOWN TO BE DEAD

Of the 915 patients with a positive diagnosis of tuberculosis, 380 (41.5 per cent.) are known to have died of tuberculosis. In addition, there are thirty-one patients who have a diagnosis of tuberculosis on the records of the institute, but who according to the official death-returns are reported as having died of other causes. In a few cases, as for instance several deaths from violence, the returns are correct. Not less than twenty-three patients of this group, however, in all probability died of tuberculosis, notably eleven whose deaths are officially returned as due to heart disease. While there is a certain amount of confusion between tuberculosis and certain forms of heart disease, particularly mitral stenosis, the mistake is usually that of considering a heart case as being tuberculous rather than the reverse.

TABLE 1.—NUMBER OF DEATHS FOR THE SEVEN YEARS

	1904	1905	1906	1907	1908	1909	1910	1911
Official report .	20	37	19	10	4	12	8	0
Phipps' report.	82	40	5	4	1	0	2	0
Investigation .	5	23	9	9	7	7	3	1
Letters	4	16	12	4	1	0	7	4
Total.....	111	116	45	27	13	19	20	5

No date specified in 24.

* Read before the Eighth Annual Meeting of the National Association for the Study and Prevention of Tuberculosis, in Washington, May, 1912.

II. PATIENTS UNTRACED

In this group there are 320 cases. This large number, comprising 34.9 per cent. of the cases treated as having tuberculosis, serves to emphasize the necessity of limiting the territory covered by the dispensary. As I have already stated, the conditions which existed when the institute was founded made it an impossibility to keep closely in touch with the patients, and this applies more particularly to those living in the overcrowded sections of the city where the population is constantly shifting from house to house. Another defect in attempting to cover too great an area is the failure of patients to keep up their attendance. The tremendous falling off of attendance after a few months is well illustrated in Table 2:

TABLE 2.—ATTENDANCE OF PATIENTS IN SUCCESSIVE YEARS

February, 1905	274	February, 1909	15
February, 1906	165	February, 1910	13
February, 1907	31	February, 1911	9
February, 1908	14		

Thus, of 915 patients with a definite diagnosis of tuberculosis, but 274 attended the following year and this number rapidly diminished each succeeding year.

III. APPLICANTS CONSIDERED NOT TUBERCULOUS OR NOT DESTITUTE

There were 152 cases in this group, and the only interest in this connection is that of diagnosis. In the majority of these 152 cases the histories show that there was nothing to warrant a diagnosis of tuberculosis, or, if tuberculous, the patients were not destitute. There were, however, fourteen in whom a diagnosis of acute or chronic bronchitis or asthma was made. While no special study was made of these cases, it is known that several of the patients have since died of tuberculosis. More recently one of my associates, Dr. Cruice, has investigated a number of patients who visited the dispensary five years ago, and in whom a diagnosis of bronchitis or asthma had been made from one examination only. Of fifty such patients from whom he was able to obtain definite information either by letter or personal examination, four have since died of tuberculosis and twenty-three have definite symptoms and physical signs of the disease at the present time.

These results serve to emphasize the necessity of more care, especially as there is a growing tendency to restrict the diagnosis more and more.

IV. PATIENTS LIVING

At the time the investigation was completed (Sept. 1, 1911), 184 patients (20 per cent.) were known to be living. According to the classification first in use at the institute, the prognosis was estimated in the following terms: favorable, doubtful and unfavorable. This classification is essentially the same as incipient, moderately advanced and advanced.

Table 3 is based on the prognosis used at the institute.

TABLE 3.—OUTCOME IN 184 CASES WITH VARIOUS PROGNOSES

	Prognosis	No Symptoms*	Symptoms,*	At Work *	Not Working *
Favorable	121	80	18	82	8
Doubtful	34	19	16	22	5
Unfavorable	5	3	2	3	2
No record	24	..	..	..	..
	184	102	36	107	15

* In addition there were twenty-four who were living but who gave no information as to their health or occupation.

As would have been expected, the great majority of those able to work belonged to the favorable or incipient group. From the 107 patients giving definite information regarding their occupations, the following facts were elicited: Forty-five different lines of work are being followed at present. It is interesting to note that ninety-five of the 107 are engaged in occupations involving inside employment and that twelve only are working at outside jobs. Furthermore, there were but nine instances in which patients changed from an inside to an outside occupation, while two others changed from outside to inside employment. The character of the work is extremely diversified, ranging from sedentary, confining clerical work to unskilled laboring work.

TABLE 4.—OCCUPATIONS OF PATIENTS, 1904 AND 1911

1904		1911	
Tailor	1	Bookkeeper	1
Unknown	2	Bricklayers	2
Unknown	1	Carpenter	1
Housework	1	Child's nurse	1
School	4		
Salesgirl	1		
Fruit-vender	1	Clerks	9
Dental student	1		
Clerks	2		
Machine operator	1		
Baker	1	Car conductors	3
Tailor	1		
Unknown	1	Cook	1
Iron-molder	1	Coremaker	1
Dancing-teacher	1	Dancing-teacher	1
Machinist	1	Dentist	1
Teacher	1	Doctor	1
Shoe-cutter	1		
Laborer	1	Drivers	3
Driver	1		
Unknown	1	Electrician	1
Teamster	1	Farmers	2
Tailor	1		
Glassworker	1	Glassworker	1
Unknown	1	Grocers	2
School	1		
House-painter	1	House-painters	2
Office clerk	1		
Mill hand	2	Housework	39
School	1		
Housework	36		
Iron-molder	1	Iron-molder	1
Coal-miner	1	Insurance collector	1
Laborers	2	Laborers	2
Mill hands	3	Mill hands	3
School	1	Leather-worker	1
School	1	Musician	1
Packer	1	Orderly	1
Weaver	1	Outdoor work	1
Threader	1	Plasterer	1
School	1	Photographer	1
Lithographer	1	Policeman	1
Unknown	1	Printer	1
Riveter	1	Riveter	1
Saleswoman	1	Saleswoman	1
Waitress	1	Scrubwoman	1
Seamstresses	2	Seamstresses	2
School	1	Shipper	1
Salvation Army officer	1	Salvation Army officer	1
Peddler	1	Storekeeper	1
School	1	Student (medical)	1
Motorman	1	Supt. of sanatorium	1
Tailors	3	Tailors	3
Tooth-molder	1	Tooth-molder	1
Typefounders	2	Typefounders	2
Typist	1	Typist	1
Baker	1	Unknown	1
Waiter	1	Waiter	1
School	1	Weaver	1
Total	107	Total	107

The question naturally arises, Can we be sure that these cases were all tuberculous? So far as the actual finding of tubercle bacilli is concerned, the evidence is not strong. Of the 107 now known to be earning their living, the sputum was positive in nine, negative in forty-seven and no examination recorded in forty-nine. On the other hand an analysis of the histories shows that in many of these cases there was exposure to the disease and that in all there was one or more than one strongly suggestive symptom, such as blood-spitting, pleurisy, night sweats, cough, loss of weight, etc. In addition physical signs indicating more or less involvement of one or both apices were present in all. Of course, it cannot be denied that some of these cases represent instances of quiescent or completely healed lesions.

In the light of our present knowledge, however, there is no method by which we can accurately distinguish between a completely healed lesion and one which is quiescent, but apt at any time to become active. So long as this difficulty confronts us the safer course is, at any rate so far as the dispensary patient is concerned, to explain the situation and do what we can toward educating the patient. As Bulstrode has well said:

> Skepticism, based on the absence of bacilli in the sputum, raises the further question as to the means by which phthisis was diagnosed in prebacillary days, or as to how it is practicable to diagnose any "closed" tuberculous lesion. It is, of course, possible to raise the question as to whether any case in which tubercle bacilli have not been discoverable in the sputum can be regarded as one of pulmonary tuberculosis, but, conversely, it would be a very serious position to take up to urge that no patients whose sputum had not yielded tubercle bacilli should be admitted into a sanatorium. It might, indeed, be regarded as a fatal objection from a curative and consequently from a preventive standpoint.
>
> It will probably be generally conceded that by the time tubercle bacilli have appeared in the sputum some breaking down of lung substance has already commenced and that if it is practicable to diagnose the presence of the disease with a fair degree of probability before the appearance of the tubercle bacilli in the sputum much valuable time may be gained.

In spite of the innumerable articles which have been written urging the importance of certain symptoms or combination of symptoms as strong evidence of tuberculosis past or present, there still exists too much timidity in making a diagnosis. Involving as it does such serious consequences if an error is made, it is safer in this instance to be radical rather than conservative, even if it has been offered in defense of the conservative attitude that we have no right, as was recently said, to place the stigma of tuberculosis on an individual unless we are practically certain that such a condition exists. Certainly any one who has seen much of tuberculosis must have been impressed repeatedly with the unfortunate results of conservatism whereby the diagnosis has been delayed until it is impossible to any longer have any doubt.

11 South Twenty-First Street.

THE MODE OF INFECTION IN EPIDEMIC POLIOMYELITIS *

SIMON FLEXNER, M.D.
NEW YORK

The problem of prevention of infection in epidemic poliomyelitis still confronts us. Progress in the study of poliomyelitis has been made and knowledge gained, but the question of supreme importance is this: Does this knowledge offer a solution of the mode of infection? With all diseases prevention is far better than the most perfect means of cure; with poliomyelitis it is better, first, because at present there exists no specific or true curative treatment, and, second and chiefly, because for the most part when the disease is first recognized it has already caused irreparable damage. An understanding of the mode of infection would lead inevitably to the framing of measures of prevention which, with reasonable certainty, could be expected to bring about a limitation of the extent of the epidemic spread.

* From the Laboratories of the Rockefeller Institute for Medical Research.

The infectious agent or virus of poliomyelitis attacks chiefly the central nervous system. Indeed, it has been detected regularly in the spinal cord and brain, and in the mesenteric lymph-nodes among all the internal organs. It has also been detected in the mucous membrane of the nose and throat, and in the mucus secretions of this membrane, and in the mucus secretions of the stomach and the small and large intestine. The virus has not been detected in such important organs as the spleen, kidneys, liver or bone-marrow. The fact is significant, but in attempting to interpret it, account should be taken of the circumstance that at present we possess only one means of detecting the virus, and that consists in its transmission to monkeys, in which it produces characteristic paralyses and anatomic changes. On this account small quantities of the virus may conceivably escape discovery. The conclusion is none the less inevitable, however, that detectable amounts of the poliomyelitic virus exist only in the few situations and organs mentioned. The distribution of the virus is identical in human beings who are subjects of so-called spontaneous poliomyelitis, and in monkeys in which the experimental affection is produced. Nor does it matter how the experimental inoculation is accomplished and whether the virus is introduced by injection into the brain or large nerves or subcutaneous tissue or peritoneum, or whether it is merely applied to the nasal mucous membrane. In whatever way the infection is produced purposely, the distribution of the virus in the infected monkeys is the same as in infected human beings.

The precise facts of the distribution of the virus are important for another reason than the establishment of the pathology of the disease. The virus is one that is not known to increase aside from the infected body, and hence in order that it shall be capable of propagating poliomyelitis, it must secure a means of escape from the infected animal. The escape is now known to occur along with the secretions of the nose and throat, and the discharges from the intestine. We are obliged therefore to ask ourselves what the means are by which the virus confined within the interior reaches these external surfaces of the body.

Let us begin by disregarding for the moment the essential point of the way in which the virus probably enters the body in infected human beings, and give our attention to the way in which it escapes in the infected monkey into the nose, throat and intestines. We may first consider the instance in which the virus is deposited in the brain, in which it becomes sealed, as it were, and cut off, apparently, from the exterior of the body. Having been injected into the brain tissue, the infectious microorganism constituting the virus multiplies both within and about the brain tissue at the site of inoculation. As multiplication progresses, the virus leaves the original site of injection and wanders to adjacent and distant parts of the central nervous tissues, becoming implanted in the medulla, the spinal cord, the intervertebral ganglia, as well as reaching the pia-arachnoidal membranes or meninges, in which it also spreads. Ultimately, when the virus becomes sufficient in amount, it brings about anatomic changes in the nervous system, one of the results of which is paralysis. The period intervening between the inoculation and the appearance of paralytic symptoms may be as brief as two or three days, or as long as three, four or five weeks. The great disparity in this period depends on the

amount and quality of the virus, as well as the degree of resistance of the inoculated monkey.

The virus, which has found its way to the meninges, does not long remain in the cerebrospinal fluid, with which it escapes in part into the blood, in which it does not appear to undergo and further increase in amount, and indeed seems even incapable of surviving long. A part also of the virus contained within the cerebral fluid escapes regularly by way of the lymphatic channels surrounding the short nerves of smell that pass from the olfactory lobes of the brain to the mucous membrane of the nose. It has long been known that there is an intimate connection between the lymphatic vessels of the nasal mucous membrane and the lymphatic spaces of the pia-arachnoidal membrane. Once having gained the mucous membrane of the nose, the virus may even escape into the mucus secretion, with which it is carried into the mouth, and in part swallowed, or it may become established in the substance of the nasal membrane, where it undergoes subsequent multiplication and increase. As a matter of fact both occur. The virus escapes with the secretions partly externally to the infected body, and a part of it is swallowed with the secretions themselves, while a persistent infection of the secretions is maintained by means of the increase that takes place in the membrane itself. In this way is assured the escape of the virus directly into external nature, as well as the contamination of the gastro-intestinal cavity, with the discharges of which it becomes commingled. From the intestine it reaches in some amount the mesenteric lymph-nodes, and thus enables us to account for the occurrence of the virus in those lymphatic nodes which form a notable exception to the general internal organs.

We have now followed the route by which the poliomyelitic virus, implanted within the apparently closed cavity of the skull, reaches the exterior of the body. It is obvious that in the spontaneous form of the infection in man no such mode of introduction of the virus can occur. The virus must indeed enter the human body by some external channel, after which it seeks and becomes implanted on the central nervous system. It is known that in monkeys the virus is incapable of passing the barrier of the unbroken or slightly abraded skin, or of being taken up from the stomach or intestine unless the functions of these organs are previously disturbed and arrested by opium, and it is further known that it traverses with difficulty or even not at all the substance of the lungs. On the other hand, it is established that the virus passes with readiness and constancy from the intact or practically intact mucous membrane of the nose to the central nervous system, and that this membrane, next to direct intracerebral introduction of the virus, gives the readiest method of successful inoculation.

Hence the view that the nasal mucous membrane is the site both of ingress and egress of the poliomyelitic virus in man. Support for this view is found in the study of the pathology of epidemic poliomyelitis, as well as by the fact established incontestably by experiment that the virus of the disease is regularly present in the nasal mucous membrane and its secretions, both in infected human beings and in monkeys.

Still one link in the chain of causation of epidemic poliomyelitis as here outlined remained to be forged. The clinical evidence is strong in suggesting that human carriers of the poliomyelitic virus exist. The virus has now been detected in the secretions of the nose, throat and intestine of patients suffering from abortive or ambulant attacks of poliomyelitis. The unrecognized examples of the abortive disease play a highly important part in the dissemination of the virus, through which the area of infection is extended, and the number of the attacked increased. Clinical observation accords a similar part to the healthy virus-carrier, who is the last to be detected and confirmed experimentally. Obstacles in the way of this confirmation are considerable, but not insuperable. We possess no means except animal inoculation of discovering the virus of poliomyelitis. Pettersson and his associates now assert that they have demonstrated the virus in washings from the nose and throat of healthy persons in intimate contact with patients having acute cases of the disease.

The preponderance of cases in the late summer and autumn months early suggested an insect carrier of the infection. House-flies can act as passive contaminators, since the virus survives on the body and within the gullet of these insects. Howard and Clark attempted unsuccessfully to infect the common varieties of mosquito and the body- and head-louse, while they succeeded, in one series, in producing infection in bedbugs which were made to feed on the blood of inoculated monkeys. The virus remained alive within these insects for a period of many days. The inoculation of monkeys with a filtrate prepared from them gave rise to characteristic paralysis and anatomic lesions. This result is significant since it shows that insects are capable of taking up the virus from the blood, in which it exists in minimal quantities, and in harboring it for a considerable period in an active state; but it does not show that multiplication occurs within them or that in nature they act as the agents of inoculation.

It is not permissible to draw hard and fast conclusions regarding the mode of infection in epidemic poliomyelitis from the number of cases occurring, or from their focal distribution, or the seasonal period of the greatest prevalence of the epidemic. While it is true that many more examples of single cases than of multiple cases in a family occur, yet multiple cases are only less frequent than single cases, and not by any means rare. The prevailing views on this topic are being modified rapidly by the recognition of the abortive and ambulant examples of the disease. While the period of greatest prevalence of the epidemic is during the months of August, September and October in the northern hemisphere, and the corresponding months in the southern hemisphere, yet the onset of the epidemic occurs in the early spring and summer months and the disease does not wholly disappear during the winter months. It cannot be affirmed strictly that the disease dies out necessarily at any period of the year. While there are epidemic factors relating to poliomyelitis that are not understood, they are neither remarkable nor unique. If the fact of seasonal prevalence is reversed, all the ordinary factors of case frequence and focal distribution relate equally to epidemic meningitis. Epidemic poliomyelitis, like epidemic meningitis, is preeminently a disease of early childhood, and finds the highest percentage of its victims in the first five years of age, but does not wholly spare older children or even adults. Like epidemic meningitis, it appears in a frank and in an abortive or ambulatory form, appears to be transmitted by a virus that enters and escapes from the body in the region of the mucous membrane of the nose and throat, can be transported by active infected carriers, and probably by healthy passive carriers of the specific microorganism or virus, and fortunately is limited in its extension by a high natural indisposition or insusceptibility to infection existing among persons of all ages.

Sixty-Sixth Street and Avenue A.

THE PRODUCTION OF ACTIVE AND PASSIVE IMMUNITY TO THE PNEUMOCOCCUS WITH A SOLUBLE VACCINE

A PRELIMINARY REPORT*

J. O. HIRSCHFELDER, M.D.
SAN FRANCISCO

The extensive employment of vaccines made from dead microorganisms has been followed by variable results; in some cases the results have been excellent, in others, absolutely negative. It seemed probable that these discrepancies might be due to the fact that in the one case an efficient quantity of the bacterial endotoxin had entered into the circulation, whereas when no beneficial results ensued it might be that a satisfactory extract of the microorganisms had not occurred. It therefore seemed logical to search for a means of dissolving the active principle of the bacteria with as little injury as possible.

After various methods had been unsuccessfully tried a solution was made by acting on the living microorganism with an alkaline pancreatin solution at 37 C. for a definite time, stopping the action by slight acidulation and filtering through a Pasteur filter. Studies with the pneumococcus showed that the virulence of the microorganism could be readily maintained by growing it in a 2 per cent. glucose, 4 per cent. glycerin veal bouillon, faintly alkaline to litmus, to which calcium carbonate had been added according to the method of Hiss and transplanting the culture daily. It is of interest to note that unless the culture with the calcium carbonate be shaken frequently it will become acid, as diffusion through the liquid is not sufficiently rapid to preserve the neutral reaction.

In order that there should be no doubt of the results, larger doses of the pneumococci than were necessary to kill the rabbit were employed; but the variability of the time necessary to kill the control was probably due to the varying acidity that developed in the culture medium. This occurred before it was discovered that the mere presence of the calcium carbonate did not preserve the neutrality of the liquid.

In these experiments, in which I was ably assisted by Dr. L. S. Mace, only a single dose of the soluble vaccine was administered, the purpose being to establish the principle that such a soluble vaccine had really been produced. The method employed was to grow the pneumococcus for forty-eight hours in the culture medium just described to which a piece of marble had been added. To this culture equal parts of a solution of 0.2 per cent. pancreatin (Cudahy) in 2 per cent. bicarbonate of soda at 37 C. were added, allowed to stand fifteen minutes in the incubator, made faintly acid with hydrochloric acid, and filtered through a Pasteur filter. Rabbits injected with a single dose of this liquid developed relative or complete immunity to a virulent pneumococcus culture in about six or seven days, as is shown by the accompanying tabulated statement of two sets of experiments. (Tables 1 and 2).

TABLE 1.—PNEUMOCOCCUS VACCINE NO. 40 (ALL ANIMALS VACCINATED DEC. 20, 1911)

Number of Rabbit	Quantity of Vaccine, c.c.	Date of Infection	Quantity of Pneumococci* c.c.	Date of Death	Number of Days Living	Pneumoc. in Blood †	Number of Control	Date of Death	Number of Days Living	Pneumoc. in Blood †
1029	10	12/24/12	0.005	1/15/12	22	+	1041	12/26/11	2	+
1030	10	12/25/12	0.005	12/26/11	1	+	1056	1/4/12	10	..
1028	10	12/26/12	0.005	1/2/12	7	0	1066	12/29/11	3	+
1027	10	12/27/12	0.005	1/10/12	14	0	1067	12/29/11	2	+
1026	10	12/28/12	0.005	12/29/11	1	0	1069	12/30/11	2	+
1024	5	12/29/12	0.005	1/7/12	9	..	1070	12/31/11	2	+
1021	5	12/30/12	0.005	1/5/12	6	..	1074	1/3/12	4	..
1023	5	12/31/12	0.005	1/21/12	21	0	1095	1/6/12	7	..

* Pneumococcus 913. † In this and Table 2, where no note of the presence of germs in the blood is made, the examination was not made or the record was lost.

TABLE 2.—PNEUMOCOCCUS VACCINE NO. 41 (ALL ANIMALS VACCINATED DEC. 24, 1911)

Number of Rabbit	Quantity of Vaccine, c.c.	Date of Infection	Quantity of Pneumococci* c.c.	Date of Death	Number of Days Living	Pneumoc. in Blood	Number of Control	Date of Death	Number of Days Living	Pneumoc. in Blood
1053	10	12/29/11	0.005	1/3/12	5	+	1070	12/31/11	2	+
1060	10	12/30/11	0.005	1/4/12	5	0	1074	1/3/12	4	..
1049	10	12/31/11	0.005	1/5/12	5	+	1095	1/6/12	6	..
1040	10	1/1/12	0.005	1/14/12	13	0	1108	1/6/12	5	+
1061	10	1/2/12	0.005	1/7/12	5	0	1109	1/6/12	4	+
1039	5	1/3/12	0.005	1/12/12	9	..	1111	1/5/12	2	+
1051	5	1/4/12	0.01	1/11/12	7	0	1113	1/6/12	2	+
1047	5	1/5/12	0.05	1/16/12	11	0	1117	1/8/12	3	..
							1119†	1/7/12	2	+
1043	5	1/6/12	0.05	1/16/12	10	..	1121	1/8/12	2	..
1050	5	1/7/12	0.05	1/10/12	3	+	1112	1/9/12	2	+

* Pneumococcus 913. † Received 0.0005 c.c.

On April 21, 1912, one rabbit was vaccinated with 5 c.c. and another with 40 c.c. of a solution prepared from a culture of the pneumococcus that had not grown very vigorously. On May 8, they and a control were each injected with 0.05 c.c. of a virulent pneumococcus culture. Two days later the control was dead of pneumonic septicemia with the microorganisms in the blood, whereas the vaccinated animals are still living. In later experiments in which two injections of the extract were given, a small one followed a week later by a larger dose, active immunity to the pneumococcus was more regularly produced in the rabbit.

It has been found that the vaccine will retain its qualities without any preservative at ordinary temperatures (45 to 65 F.) for at least somewhat over three months. A rabbit that had been vaccinated April 1,

* From Cooper Medical College.

1912, with 5 c.c. of the pneumonic extract No. 40 that had been prepared Dec. 20, 1911, was inoculated, together with a control, April 10, 1912, with 0.05 c.c. virulent culture of pneumococcus. The vaccinated animal is still alive, whereas the control died in two days and pneumococci were isolated from the heart's blood. Another rabbit, injected April 11, 1912, with the same extract is likewise still living, the control having died within twenty-four hours and pneumococci having been cultivated from the heart's blood.

In order to determine whether it would be possible to produce a serum which would afford passive immunity, a dog was injected with increasing doses of the pneumonic extract from Dec. 28, 1911, to April 13, 1912, when he was bled. A rabbit injected with 4 c.c. of the dog's serum intravenously March 14, 1912, and subcutaneously with 0.05 c.c. virulent culture of pneumococcus, is still living, whereas the control rabbit was dead within three days and the pneumococci were cultivated from the heart's blood. March 24, 1912, the dog was again bled and on March 25, 1912, two rabbits received 6 c.c. of the serum intravenously and 0.05 c.c. virulent pneumococcus culture subcutaneously. Two controls died within two days with pneumococci in the blood. The one vaccinated rabbit lived until April 8, 1912, and the other until April 13, 1912, and the heart's blood of both was found to be sterile. In order to be positive that the pneumococcus with which I was operating was not sensitive to normal dog's serum 6 c.c. of the latter was injected intravenously into a rabbit and 0.05 c.c. virulent pneumococcus culture was administered subcutaneously, March 21, 1912. The rabbit died March 22, 1912, and the control March 23, 1912, and pneumococci were cultivated from the heart's blood of both rabbits.

Unfortunately the serum of the dog cannot be used on human beings on account of its toxicity, and experiments are being made for the purpose of producing antipneumonic serum from sheep and horses.

Ten patients with pneumonia were treated with an extract prepared from an emulsion of the same washed living pneumococci. All recovered. In a majority of the cases crisis set in within twenty-four hours after the first dose. A striking fact observed was a rapid fall of the number of leukocytes within twelve hours and preceding the reduction of temperature. The number of cases is far too small to warrant an estimate of the value of the treatment but certainly proves its harmlessness.

The cases are presented in Table 3:

TABLE 3.—PNEUMONIA PATIENTS TREATED WITH PNEUMOCOCCUS VACCINE

	Treatment Begun After Initial Chill.	Crisis.
1.	32 hours	within 24 hours
2.	3½ days	within 12 hours
3.	4 days	within 6 hours
4.	4 days	within 12 hours
5.	5 days	within 5 days
6.	5 days	within 24 hours
7.	5 days	within 24 hours
8.	5 days	within 43 hours
9.	5 days	within 56 hours
10.	12 days	within 36 hours

Since cases of pneumonia are comparatively rare in San Francisco at the present season, we have been unable to test the extract in the large number of cases necessary in order to form reliable conclusions. Because of the well-known variability of the virulence of the organism in different communities and in different seasons, it is desirable to test this extract under as diverse conditions as possible. I shall be glad to furnish the extract to hospitals and research institutions free of charge, on request.

Encouraging experiments are being conducted with various other germs treated in a similar manner. The results will be reported later.

1392 Geary Street.

A GRAPHIC MENSTRUAL CHART

CATHARINE MACFARLANE, M.D., PHILADELPHIA

It requires but a short experience in taking gynecologic case histories and in reading such histories as taken by students and resident physicians to demonstrate the difficulty of grasping quickly and remembering accurately the patient's exact menstrual history. Unless a rather wordy description is written and referred to at each visit, the same questions will be put to the patient repeatedly, and, after the history has extended over several months, only moderately accurate replies will be obtained.

After a considerable period of dissatisfaction with present conditions I endeavored to formulate a method of graphically

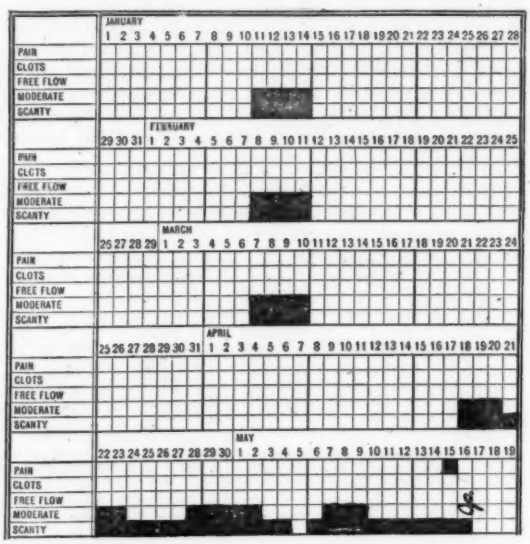


Fig. 1.—Menstrual chart of a case of ectopic pregnancy. Operation, May 16, 1912. There is space on the paper containing the chart to record the name, diagnosis, operation and such other details as are desirable.

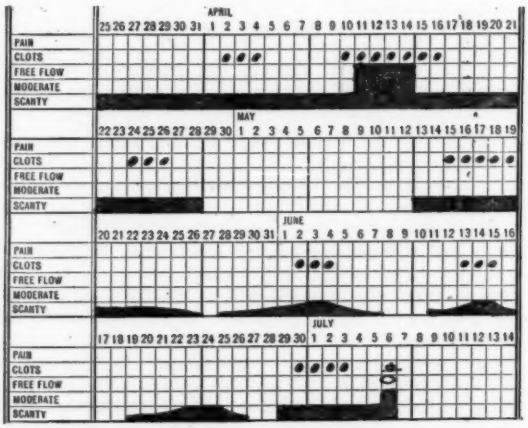


Fig. 2.—Menstrual chart of a case of hypertrophic glandular endometritis. Curettage, July 6, 1912.

recording the patient's menstrual history similar to that universally used for recording variations in pulse, temperature and respiration. The resulting chart, after several months' trial in private and hospital practice, has proved a great improvement over anything previously used.

In private practice a chart is given to the patient at her first visit with directions as to using it. This is brought to the office at each subsequent visit, filled out to show any regular or irregular uterine bleeding, the passing of clots or the occurrence of pain during the intervals. In hospital practice the details of these symptoms throughout the period of the patient's present illness are recorded on the chart by the resident physician when taking the history, and further notes are made day by day as necessary during the patient's stay. As one of the resident physicians in the Woman's Hospital expressed it, "by the time I have filled in the graphic chart for the required period, there are not many questions left unasked." From the standpoint of the visiting chief, the satisfaction afforded by this accurate, concise record cannot be exaggerated. Instead of being obliged to read through a series of disjointed facts relating dates and days of pain, bleeding, etc., one is enabled to see at a glance the whole situation, and one's memory can be refreshed at any time by consulting the chart.

Figures 1 and 2 show sections of the menstrual charts of a case of ectopic pregnancy and of a case of hypertrophic glandular endometritis, respectively.

1709 Pine Street.

A CLINICAL INCUBATOR AT SMALL COST

C. EMERSON, PH.D., M.D., LINCOLN, NEB.

I have devised an incubator for bacteriologic work that keeps a very satisfactory uniform temperature and can be constructed easily by any one at small cost, as follows:

1. A galvanized iron box, 12 inches in all dimensions, is provided with a hinge or slide door on one side and openings for the adjustment of the heat-regulating apparatus.

2. The heat-regulating apparatus is an expanding drum, A, suspended within the box and this on expansion and contraction under the influence of varying degrees of temperature operates a lever, B. This lever ends in a copper plate, C, which, when at rest on top of the box, is in contact with the two copper wires D and D'. The thermostat indicated in the diagram is such as is used on "Queen Chicken Incubators," except that the metal disk used in the incubator merely for controlling a current of air is replaced by a disk of copper. Of course, there is insulation between this copper disk and the lever.

3. The wiring, as illustrated in the diagram, may be explained by starting at the plug, E, which connects with an ordinary electric lamp-socket. One of the wires in the lamp cord, F, is attached to a heavy copper wire, D, which is insulated except near the end where it comes in contact with the copper plate. The other wire in lamp cord, F, is carried to the plug, G. The second wire from plug G ends in the heavy copper wire D', which is insulated except near the end where it forms the second connection with the copper plate, C. The plug, G, inside the incubator is connected with a single electric lamp which will furnish sufficient heat for this apparatus. The electric lamp is placed in one corner of the box. A tin partition separates the lamp from the rest of the incubator so that light is excluded.

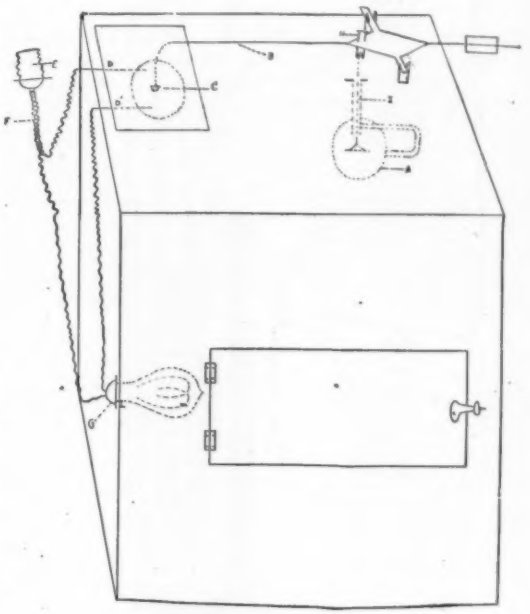
4. The insulation deserves special note. The lamp-cord has its usual insulation. The copper wires D and D', insulated except near the end, pass between two layers of rubber insulation, such as is used by electricians, until they have reached a point immediately beneath the copper disk, C. Then they pass upward through the upper layer of insulation with their ends not insulated in contact with the copper plate when the latter is at rest. These two layers of insulation are riveted to the top of the box. There should be insulation between the copper disk, C, and the lever, B. The lever surrounded by rubber is passed through a hole in the center of the copper disk and ends in a loop of sufficient size so that the disk cannot slip off.

The mechanism is as follows: When the temperature is low in the box the copper disk, C, rests on the two wires, D and D', so that the circuit is made and the lamp or heating plate functions. As the heat increases in the box the drum, A, expands, and when the temperature reaches a certain point determined by the adjustment of the screw, H, the lever, B, is pushed upward by means of the piston, I. The copper disk, C, is raised from its contact with the wires and the circuit is broken.

The expanding drum is more delicate than the thermometer. The light is continually flashing on and off while the temperature as indicated by the thermometer does not vary to the extent that it can be recognized by the eye. This incubator has been in operation for four weeks and I have not detected any variation in the thermometer.

The cost is comparatively slight: The galvanized iron box was made by a tinner for $1. The thermostat costs $1.75. The copper disk, plugs, wiring and insulation may be obtained from an electrician, already connected, ready for adjustment to the box, for less than $1.50.

Certain variations may be made. The box will be better if made of asbestos since radiation will not be so great and the cost of the current to operate it will be less. Other varieties of hot-air thermostats may be used and I have omitted to give the exact location and size of apertures for their adjustment because they vary in this particular. The one I have used is simple, cheap and efficient. Socket G may be connected with an electric plate or a plug for several electric lights, making possible the construction of larger incubators.



Inexpensive clinical incubator.

A POCKET MERCURY SPHYGMOMANOMETER

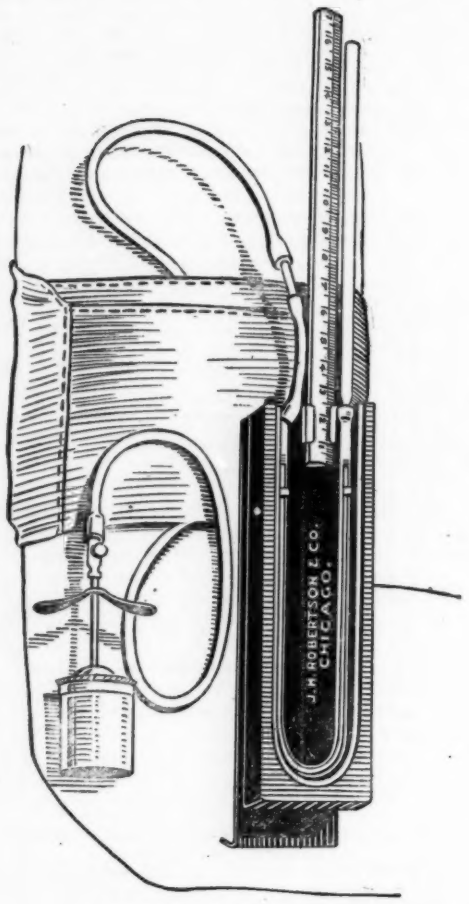
B. M. LINNELL, M.D., CHICAGO
Associate Professor of Medicine, Rush Medical College

The instrument consists of a U tube of mercury with a ground-glass joint, an arm and a sliding scale graded in millimeters in a leather-covered box. This form of manometer is the most accurate because the air-space is reduced to a minimum.

The instrument is set up by hanging it on hook attached to the upper part of the cuff, pinning it to the clothing, or having it held. Any cuff may be used but a cloth-covered

cuff (4½ to 5 inches wide) is preferable because more easily portable. The pump may be a rubber bulb, but I prefer a metal pump, similar to the Bier pump with valves reversed. It is more durable and occupies less space. The U tube must come within one-eighth of an inch of the top.

When the box is closed the rubber tubing over the cuff end can be folded and held in place by the cover of the box. The ground-glass joint can be stoppered with a rubber stopper or a lead-pencil rubber eraser, which is also held in place by the cover. The folding cover is buttoned at the bottom. If properly adjusted the mercury will not leak out even with the shaking it gets in an automobile. The box and cuff can easily be carried in a coat pocket or small satchel.



A pocket mercury sphygmomanometer.

In taking a reading the usual precautions are to be observed. With a U-tube manometer the mercury goes down in the arm nearest the pump and cuff and up in the extension. The difference between the levels in the two arms is the amount of pressure, so the reading on the scale must be multiplied by 2 to arrive at the correct reading; for example, if the mercury rises to 6, which is 6 cm., or 60 mm., $2 \times 60 = 120$ mm., the correct reading. Simplicity and accuracy are the chief characteristics of this instrument. An office instrument may be made by using a tube carefully tested, without a joint and supported by an ordinary laboratory standard, the cuff and pump being the same. A 150 mm. ruler is attached to the long arm of the U tube and set at the mercury. I have used such an instrument in my clinic at Rush Medical College for four years with great satisfaction. Its simplicity makes it self-explanatory to the students, and its cost is small.

SUCCESSFUL TRANSPLANTATION OF URETER FROM VAGINA TO FUNDUS OF BLADDER TWENTY MONTHS AFTER WERTHEIM OPERATION IN WHICH GREATER PART OF TRIGON WAS RESECTED

GASTON TORRANCE, M.D., BIRMINGHAM, ALA.
Surgeon to St. Vincent's Hospital

History.—The patient, Mrs. J. L. H., aged 45, consulted me Jan. 6, 1910, for an extensive carcinoma of the uterus. The family history was negative. Menstruation began at 15, was irregular and rather profuse. The patient was married at 18 and had three children, the eldest 29 and the youngest 22; there were no miscarriages; menstruation had been regular since the birth of the first child. The patient had never had any serious illness. In November, 1908, she began to have a continuous, free, bloody discharge. Six months prior to operation she began to have severe pain in the back and in the pelvis and the discharge became very offensive.

Examination.—The patient was very much emaciated, having lost 45 or 50 pounds, and very cachectic. The cervix was a mass of broken-down cancerous tissue which bled profusely when sponged, and extended well up into the uterus and down an inch or more into the vagina; there were no pelvic adhesions. A very grave prognosis was given and operation suggested with no assurance of an operative recovery.

First Operation.—Four days later, under ether, Wertheim's operation was done, resecting about an inch and a half of the vagina and the trigon of the bladder, leaving an opening about 2 inches long in the bladder, which was closed by the method of C. H. Mayo; the ureters were dissected up to the brim of the pelvis, and uterine vessels tied as close to the pelvis as possible and all surrounding tissues dissected out. The peritoneal flap from the anterior part of the pelvis was drawn back and sutured to the rectum and pelvic brim, completely shutting off the pelvis from the abdominal cavity.

The patient made a good recovery with no complications except a slight urinary leak from the vagina. She regained the fifty pounds she had lost and her normal color in two or three months, when she returned to her home in Kansas City. Sixteen months later she returned to have me close the bladder fistula. She was voiding some of the urine, but the greater part was escaping by the vagina.

A very small-pointed sound in the bladder could be clicked with one in the vagina. This was closed and the amount of urine voided was increased, but still about half passed through the vagina.

Cystoscopic examination showed a patent ureter on the right side, which was catheterized, and blue urine was collected from it after the injection of indigocarmin, subcutaneously. The scar in the bladder was strong and in a healthy condition; there remained only a scar where the left ureter should have been. During this cystoscopic examination blue urine was seen to trickle from the vagina; the cystoscope was passed up into the vagina and the opening of the ureter located well up on the outer side of the pelvis, where the ureter had been caught in the scar tissue; a lateral leak about 2 inches from the bladder was draining into the vagina. I experienced no trouble in passing a catheter through this opening up to the kidney.

Transplantation of the ureter was advised, but was postponed four months to avoid the summer.

Second Operation.—An attempt was made to pass a stiletted catheter, but it was not possible on account of the angle formed by the adhesions to the ureter. Under ether an incision was made, low down, through the left rectus. The posterior peritoneum was divided on the side of the pelvis at the outer extremity of the common iliac artery. The internal iliac was exposed and followed down to locate the ureter, which was drawn close to the rectum, and followed down beneath the peritoneum to the point where it became adherent to the vagina; with one finger in the culdesac and one behind the peritoneum the ureter could easily be felt. After the ureter was clamped close to the adhesion and the distal end ligated it was divided and brought up, and it was found that by some tension it could

be transplanted to the upper part of the bladder. A small opening was made in the fundus of the bladder and the end of the ureter, after being split, was drawn into the bladder by passing a fine catgut suture, with a needle on each end, through the flap and then through the bladder wound and out through the wall of the bladder, so that when tied the flap of the ureter was drawn down against the wall of the bladder cavity; the ureter was then buried in a trough in the bladder wall by means of interrupted sutures of linen. The peritoneal wound was closed over the ureter. About an inch of the ureter, which was left projecting out over the pelvis without any covering, was covered by the omentum and sigmoid. But for the fact that the kidney was low on this side an anastomosis would have been almost impossible, as the bladder was small and less easily manipulated on account of the previous resection and an inch or two of the ureter had been sacrificed in the vaginal scar.

Postoperative Course.—The patient made a good recovery. The urine was bloody for several days, as I have always found it to be in cases in which I had to dissect the ureters up for some distance, and this made me feel confident that the ureter was patent.

The only complication was a chill at the end of the first twenty-four hours, which was probably due to the lodgment of a small blood-clot in the lower end of the ureter; this cleared up in a few hours and recovery was rapid.

The patient left the hospital at the end of four weeks and came back a month later for a cystoscopic examination. I used a Brown-Burger cystoscope and after catheterizing the right ureter I had to turn the instrument completely over to locate the ureter implanted in the fundus of the bladder; this ureter was easily catheterized and clear urine was collected, but as the catheter, a No. 7, could be passed only about 3 cm., I decided to inject indigocarmin again. The blue urine promptly appeared, thereby demonstrating the patency of the ureter.

A NEW ANTRUM IRRIGATOR

C. COULTER CHARLTON, M.D., ATLANTIC CITY, N. J.

My antrum irrigator, shown in the accompanying illustration, on account of its simplicity, has given great satisfaction and proved a time-saver. It was designed by me two years ago and has proved invaluable in clinical work, in which so many cases are seen and treated during a limited period

A new antrum irrigator.

of time. The instrument is a long needle with a special curve, having a handle and tip for attaching rubber tubing. The curve of this instrument has proved to be superior to others that were intended to enter the antrum through the inferior meatus. It is very easy to manipulate, and, as it was intended to enter the maxillary sinus below the inferior turbinate, it is an instrument of safety even in the hands of the inexperienced.

To irrigate the maxillary sinus, anesthetize the nasal mucous membrane at the selected point of entry, which is usually about 20 mm. posteriorly to the anterior tip of the lower turbinate and 5 mm. below its attachment to the antral wall. Holding the irrigator between the thumb and index-finger, introduce it with the point downward and rotate outward and upward to the point selected. Then a little pressure backward and outward, bringing the handle of the instrument to the opposite side forming an angle of 45 degrees from the midline, causes it to enter the antrum easily. The syringe containing the solution having been previously attached with tubing, everything is ready for irrigation.

By this procedure the solution flows through the instrument that is in the artificial opening and returns to the nasal cavity through the normal opening or openings. In this method the return flow is more remote from the inward flow and causes a more thorough cleansing, with less pain, as the pressure required to force the solution through the sinus is not so great. When the irrigation is completed, force a syringefull of air into the sinus, which will cause the excess of solution to be expelled.

1101 Pacific Avenue.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

BACILLUS PESTIS VACCINE.—This vaccine is claimed to be of value as a prophylactic against infection by plague.

H. K. Mulford Co., Philadelphia.

Plague Bacteria.—Marketed as follows: I. Single-dose vaccination in 1 Cc. ampules. Standardized to contain 5 billion killed B. pestis (plague bacilli) in each Cc. II. Ten single-dose vaccinations in one 10 Cc. ampule. Standardized to contain 5 billion killed plague bacilli in each Cc. III. Single two-dose vaccination in two 1 Cc. ampules. Two vaccinations are used for one immunization. The first dose (red label) is standardized to contain 1 billion and the second dose (white label) to be injected from seven to ten days later or when the reaction to the first injection has subsided is standardized to contain 2 billion killed B. pestis in each Cc. IV. Ten two-dose vaccinations in two 10 Cc. ampules. Each Cc. of ampule with red label, marked "First vaccination," is standardized to contain 1 billion killed B. pestis. Each Cc. of ampule with white label, marked "Second vaccination," is standardized to contain 2 billion killed B. pestis.

MIXED VACCINES.

H. K. Mulford Co., Philadelphia.

Staphylo-Strepto-Bacterin Mixed.—Marketed in a package of four syringes: Syringe A. A mixed vaccine containing about 50 million killed staphylococcus pyogenes aureus, 50 million killed staphylococcus pyogenes albus and 25 million killed streptococcus. Syringe B. A mixed vaccine containing about 100 million killed staphylococcus pyogenes aureus, 100 million killed staphylococcus pyogenes albus and 50 million killed streptococcus. Syringe C. A mixed vaccine containing about 200 million killed staphylococcus pyogenes aureus, 200 million killed staphylococcus albus and 100 million killed streptococcus. Syringe D. A mixed vaccine containing about 400 million killed staphylococcus pyogenes aureus, 400 million killed staphylococcus pyogenes albus and 200 million killed streptococcus.

SERUM ANTIDIPHTHERICUM AND ANTIDIPHTHERIC GLOBULINS (See N. N. R., 1912, p. 201).

Cutter Laboratory, Berkeley, Cal.

Diphtheria Antitoxin, U. S. P.—Marketed in syringes containing 1,000, 2,000, 3,000, 4,000 and 5,000 units; also in bulbs. Diphtheria antitoxin globulin marketed in syringes containing 1,000 units.

TUBERCULIN PREPARATIONS (See N. N. R., 1912, p. 214):

Cutter Laboratory, Berkeley, Cal.

Detre Differential Test.—Made up of one tube each of Tuberculin O.T., Tuberculin B.F. human, Tuberculin B.F. bovine. Each tube contains about 1/10 Cc.

Tuberculin O.T. (Dilution) Von Pirquet's Reaction.—Marketed in packages containing ten capillary tubes and one ejecting bulb.

VACCINE VIRUS (See N. N. R., 1912, p. 208).

The Slee Laboratories, Swiftwater, Pa. (Abbott Alkaloidal Co., Chicago).

Glycerinated Vaccine Virus.—Marketed in packages containing respectively five and ten capillary tubes.

NON-PROPRIETARY BRANDS OF ACCEPTED ARTICLES

The following brand of an accepted article having been found to comply with the standards adopted, the Council voted that it be listed:

Bismuth Betanaphtholate, Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York).

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[*For other information see second page following reading matter*]

SATURDAY, OCTOBER 12, 1912

THE UTILIZATION OF THE HIGH-CALORIE DIET IN TYPHOID FEVER

The employment of a more liberal diet, consisting of 4,000 calories and upward per day, in the management of typhoid fever has received prominence as the result of the painstaking studies of Shaffer and Coleman:[1] The excellent outcome which they have reported has inspired a wide-spread interest in the subject. Physiologically it appears decidedly reasonable to prevent the loss of body weight and preserve nutritive equilibrium in any condition in which profound demands are made on the body's store of energy, especially when the deficit is likely to be prolonged over a considerable period of time. Nothing short of the excellent recoveries, the relative absence of relapses and other favorable features reported could have sufficed to win the day against the prejudice which has long existed against liberal feeding in typhoid fever under conditions that have commonly been supposed to involve the deficient digestive cooperation of the alimentary tract. The daily use of a quart of milk, a pint of cream, six or seven ounces of milk-sugar, several eggs, toast, butter, cereals, potato, custards and apple sauce — in short, a dietary calculated to more than satisfy the appetite of an ordinary healthy man—in a disease supposed to call for most careful sparing of the gastro-intestinal canal, has evoked silent protest or even mild reproof in some quarters. It has been well said, however, that things move along so rapidly nowadays that people who say "it can't be done" are often interrupted by somebody doing it. And so the diet in typhoid has increased so much in some clinics that patients in the height of their fever are given more food than was formerly given in the later periods of their convalescence.

Inasmuch as clinical experience has now shown that patients do well on this diet, we may assume that they utilize the generous diet satisfactorily. Of course it requires little investigation to discover that the so-called "high-calorie diet," described above has been rationally selected. Meat is excluded; easily digestible carbohydrates are abundant; fats are liberally administered in palatable forms and furnish a considerable contribution to the energy intake; in its make-up the diet is decidedly antiputrefactive in character. Nevertheless there have been frequent misgivings among competent critics as to the real extent of absorption of the unusually large amounts of fat in particular, especially during the assumed depression of the digestive functions correlated with the febrile condition.

The question under debate is one that can be solved by experimental investigation, and an answer has been formulated by Dr. Du Bois[2] of New York. In a most creditable research, illustrative of the type of superior clinical study which we hope to see far more prominent in our American hospitals than it has been in the past, Du Bois has determined directly the food utilization of a series of patients maintained on the Coleman diet in the wards of Bellevue Hospital, New York. His work shows that the stools of typhoid fever patients on the high-calorie diet closely resemble normal stools. The indican excretion in the urine compares favorably with what may be observed in normal individuals, and there is no evidence of any irritation of the intestinal tract attributable to the diet. The essential facts may be summarized by the statement that throughout the disease the patients can absorb carbohydrates and proteins quite as well as can normal individuals. They can, further, absorb large amounts of fat; but the percentage of absorption is somewhat lower than the normal, especially in the earlier part of the disease.

Such findings encourage added confidence in the importance of the newer dietotherapeutic recommendations for typhoid fever and assure for them a more respectful consideration on the part of a critical profession. Granting the possibilities of satisfactory nutrition here substantiated, the serious problem of actually administering these large quantities of food to an indifferent and lethargic patient confronts the clinician for practical solution. Good nursing holds the secret to success. The best efforts of a skilful dietetic art and faithful, energetic and intelligent bedside attendance will overcome many apparently insuperable difficulties. High-calorie feeding is assuredly a possibility.

1. Shaffer, P. A., and Coleman, W.: Protein Metabolism in Typhoid Fever, Arch. Int. Med., December, 1909, p. 538. Coleman, W.: The High Calorie Diet in Typhoid Fever, Am. Jour. Med. Sc., 1912, exliii, 77.

2. Du Bois, Eugene F.: The Absorption of Food in Typhoid Fever, Arch. Int. Med., September, 1912, p. 177.

THERAPEUTIC RESEARCH

The attention of our readers has already been called[3] to the constructive work now being conducted by the Council on Pharmacy and Chemistry through its Committee on Therapeutic Research. The subject was also discussed in the Trustees' report[4] at the Atlantic City session, and attention called to the fact that liberal appropriations had already been made for the use of the committee. This work is in direct line with the basic objects of the Council[5]— the advancement of thera-

3. Natural and Synthetic Salicylic Acids, editorial, The Journal A. M. A., January 13, p. 116.

4. The Journal A. M. A., June 8, p. 1786.

5. Sollmann, Torald: Therapeutic Research, The Journal A. M. A., May 4, p. 1390.

peutics through the substitution of definite knowledge for vague impressions and general beliefs that have too long prevailed, in recognition of the fact that therapeutics, particularly drug therapeutics, has not kept step with other branches of medical science.

The first result of the committee's appointment was a pharmacologic study, by J. A. Waddell,[6] of the effects and toxicity of sodium salicylates of natural and synthetic origin, which disposed conclusively of the asserted dangerous character of the so-called synthetic sodium salicylate.

Four papers, which are more or less directly the result of this committee's efforts, were presented before the Section on Pharmacology and Therapeutics at the session of the American Medical Association last June. Three are printed in this issue, and the fourth, by R. A. Hatcher, appeared in the September *Archives of Internal Medicine*.[7] They illustrate the character of the work which is to be done and show its immense value to the medical profession.

The first of these papers, by N. M. Harris of the department of bacteriology, University of Chicago, is an attempt to determine the efficiency of intestinal antiseptics, regarding the action of which, despite the claims of those commercially interested in their exploitation, little positive evidence is available. The critical review of the literature and the personal investigations conducted in the Johns Hopkins Hospital make it plain that the effects of intestinal antiseptics, if any, cannot be determined by merely watching the clinical progress of the case, and that no reliable chemical or bacteriologic methods are available for the measurement of intestinal putrefaction, but that the actual effects of intestinal antiseptics cannot be very great. As a moderate antiseptic action may be useful, at least as an adjuvant to other treatment, it would be valuable if such an action could be demonstrated and a method devised for comparing the relative efficiency of the various "intestinal antiseptics" on the market. Until such a method has been worked out it will be well to remember that assertions made in behalf of this or that proprietary product are based on mere beliefs and opinions, that the action has not been demonstrated by trustworthy experiments and that any marked effect on intestinal putrefaction is highly improbable.

The paper by J. A. Capps, a member of the Council on Pharmacy and Chemistry, "Effects of Iodids on the Circulation," is an inquiry, preliminary to actual investigation, into the existing data on an important subject. The extensive use of iodids in cardiovascular disease, especially in arteriosclerosis, furnishes strong presumptive evidence that they have a beneficial effect. But as to the nature and the mechanism of this effect, there are few definite data either experimental or clinical. Capps discusses the various explanations offered and concludes that the theories so far proposed are unsatisfactory and that the whole question awaits solution. He inclines to the belief that the key to the iodid action will be furnished by a closer study of the condition in which it is mainly if not solely effective, namely, syphilitic endarteritis. Here, it is believed, iodids cause absorption of the cellular infiltration of the vessel wall, thereby enlarging the volume of the blood-vessels and restoring their elasticity. The flow of blood would thus be equalized and the heart relieved without necessarily altering the general level of blood-pressure.

If this view is correct, the mechanism of the circulatory improvement would be solved. The remaining question, the mechanism of this absorption, opens up the whole subject of the mode of action of iodids in syphilis. This question also is mainly in the speculative stage. Capps discusses the theories so far advanced, points out their unsatisfactory nature and offers a new theory, that a proteolytic ferment is formed by the union of iodid with antibody, which ferment has a selective action on the cellular exudate. Means whereby this theory may be proved are suggested and the future work along the indicated lines may be looked forward to with interest. Actual knowledge as to the mechanism of the action of iodids would be of inestimable value to medicine. The present paper is of value chiefly in that it emphasizes how little definite information we have.

The duration of the action of digitalis has important bearing on the dosage and cumulative action of this drug. These are matters of great importance in digitalis therapy regarding which we have no very definite conception. Much confusion also has been created by the unreliable and often almost absurd affirmations concerning the many new digitalis preparations and principles which are being put on the market constantly, which have detracted from a better understanding of the drug itself. For this reason the next two papers, an experimental study by R. A. Hatcher of Cornell University Medical College and a member of the Council, and the clinical study of Eggleston, also of Cornell University Medical College, have great practical as well as scientific interest. The work gives a good picture of the duration of digitalis action and should enable physicians to prescribe the drug more intelligently and avoid overdosage as well as underdosage, which have in the past been potent for much uncertainty if not harm or danger.

Eggleston also discusses whether this persistence of digitalis action is due to the actual persistence of the drug in the tissues or whether the effects outlast the presence of the drug. The fact that the effects of ouabain (New and Nonofficial Remedies, 1912, p. 168) disappear promptly, is presumptive evidence that the continued action is due to persistence of the drug in the tissues and not merely to a persistence of the effects.

It is believed that these papers show strikingly the possibilities of the work undertaken by the Council's

6. Waddell, J. A.: A Comparative Investigation of the Effects and Toxicity of Sodium Salicylates of Natural and Synthetic Origin, Arch. Int. Med., December, 1911, p. 784; abstr. in THE JOURNAL A. M. A., January 13, p. 143.
7. Abstracted in Current Medical Literature Department, p. 1402.

Committee on Therapeutic Research and also of the vast amount of work which must be done before the action of even our "best-known" drugs is fully understood. The matter presented, it seems to us, also contains a strong suggestion that physicians should attempt to become better acquainted with the standard drugs and their preparations before they experiment with new things, no matter how alluring the claims for some new drug may sound.

RECENT WORK ON POLIOMYELITIS—THE BITING FLY AS AN INTERMEDIARY

From time to time the attention of our readers has been called by editorials and by special articles to the important advances in our knowledge of anterior poliomyelitis. Contributions of the greatest importance were announced recently in Washington. The entire morning session of two of the sections of the International Congress on Hygiene and Demography was devoted to a joint discussion of poliomyelitis which was participated in by men prominent in recent studies of the disease. The papers and discussions included a comprehensive presentation of the facts previously known regarding the etiology and epidemiology of the disease and the results of newer studies presented in this country for the first time.

THE JOURNAL has previously referred to the fact that various observers have demonstrated the virus of poliomyelitis in the nasopharyngeal mucosa and tonsils of monkeys and human beings infected with the disease; but although many investigators have reported attempts to demonstrate the virus in the secretions of the nasopharynx and intestines, all had reported negative results until Kling, Wernstedt and Pettersson[1] presented their work in which they showed, for the first time, the infectiousness of the secretions of the nasopharynx and intestines of persons who had died of poliomyelitis. At the Washington meeting Dr. Pettersson presented a summary of the more recent investigations of Kling, Wernstedt and himself, in which the virus of poliomyelitis was also shown for the first time to exist in the buccal and intestinal secretions of persons in the acute stage of the disease, convalescents, persons suffering from clinically obscure infections of poliomyelitis, and apparently healthy persons in the immediate vicinity of poliomyelitis patients. These investigators obtained secretions from such persons by washing out the mouth, nose, pharynx and rectum (the latter having first been emptied by a large enema) with salt solution. The washings so obtained were passed through a Heim filter, which restrained the bacteria present, but allowed the virus of poliomyelitis to pass. The filtrate was injected into the peritoneal cavity of monkeys and usually also into the sciatic nerve.

Inoculations were made with the buccal and intestinal secretions of eleven patients with acute cases of poliomyelitis, both mild and severe, and the virus was demonstrated in ten of the eleven. Positive results were obtained with seven out of twelve specimens of buccal secretions and with nine out of ten intestinal washings. The intestinal or buccal secretions of eight out of nine convalescents were shown to be still infectious more than four weeks after the onset of illness, in one case as long as seven months. It would therefore seem that the virus of poliomyelitis may be present in the secretions of infected persons for weeks after all acute symptoms of the disease have ceased.

The virus was demonstrated in the mouth secretions of three persons who had not, so far as known, been in contact with any recognized case of poliomyelitis but who had themselves suffered from rather slight illness, but with no symptoms characteristic of poliomyelitis. Most important of all was the report by Dr. Pettersson that he and his colleagues had succeeded in demonstrating, for the first time, the virus of the disease in the buccal and intestinal secretions of persons who gave no history of recent illness but who had been in intimate contact with other persons in their own families sick with poliomyelitis. "Virus carriers" were found in six families. The opinion was expressed that such carriers were most likely very common during epidemics of poliomyelitis, probably exceeding the number of persons with clinically recognizable infections. These results of Kling, Wernstedt and Pettersson would seem almost to justify the conclusion that the infection is disseminated by transfer of the virus directly from person to person, "virus carriers" and abortive cases accounting to a large extent for the spread of the disease.

Considerable doubt was cast on the justification of such a conclusion, however, as a result of the observations reported by Prof. M. J. Rosenau of the possible agency of the stable-fly, *Stomoxys calcitrans*, as a transmitter of the disease. Dr. Mark W. Richardson of the Massachusetts State Board of Health had summarized the epidemiologic investigation of poliomyelitis made in that state from 1907 to 1912, in which the evidence was strongly in favor of the fly transmission of the disease. Impressed with this evidence, Dr. Rosenau, in cooperation with the State Board of Health, undertook experiments to determine whether the *Stomoxys* could transmit poliomyelitis. Dr. Rosenau stated that six out of twelve monkeys exposed daily for several weeks to the bites of large numbers of *Stomoxys*, which were also daily allowed during this time to bite monkeys experimentally infected with poliomyelitis, had developed symptoms of the disease. Of the six monkeys, two had become paralyzed and died, three were paretic at the time of the report, and one after a short illness had recovered. Several of the sick animals had a preliminary diarrhea before developing paralysis. Sections of the cord from one of the dead monkeys showed lesions characteristic of poliomyelitis, while the cord of the others showed degenerative changes which, in the absence of infiltrative lesions, were not considered sufficiently typical to justify

1. Kling, C., Wernstedt, W., and Pettersson, A.: Ztschr. f. Immunitätsforsch. u. exper. Therap., 1912, xU.

a diagnosis. Sufficient time had not elapsed at the date of the report to determine the results of an attempt at transmission with the cord of the paralyzed monkey.

This preliminary announcement will naturally focus the attention of all students of poliomyelitis on the *Stomoxys* as the transmitter of the disease, and the work presumably under way in many laboratories, as well as the epidemiologic observations from this new point of view so strikingly presented by Dr. Rosenau, will doubtless clear up the present apparent inconsistencies. The epidemiologic studies of the disease now being made by the United States Public Health Service at Buffalo will probably throw further light, from the epidemiologic side, on the insect theory of the transmission of the disease, and more complete reports from Dr. Rosenau may fully establish the correctness of his preliminary announcement. At present the question remains an open one as to whether the disease is directly contagious, whether a biting fly is a necessary factor in its transmission, or whether it may be conveyed in more than one way.

If it be proved that the stable-fly is the chief or only means of transmitting the disease, its prevention and eradication will be a comparatively easy matter, as a campaign of destruction against this species of fly should be much more easily conducted than those which have been successfully conducted against the malarial and yellow fever mosquitoes and other insects which have been shown to be transmitters of deadly diseases.

It is a matter for congratulation that from the time when Landsteiner and Popper first showed the transmissibility of poliomyelitis to monkeys, many of the additions to our knowledge of the experimental disease, as well as of its epidemiology, have been made by American investigators. Should Dr. Rosenau's preliminary announcement be confirmed by further work showing the bite of the stable-fly to be the only method by which the disease is transmitted, it would be another cause for congratulation that the way for the eventual control of the disease was pointed out by an American.

CULTIVATION OF MALARIAL PLASMODIA

Bass[1] in 1911 announced that he had successfully cultivated the parasites of the three forms of malaria. As set forth in a recent note, Bass and Johns[2] were later sent by the Tulane School of Tropical Medicine to Central America and carried on work in Panama in the cultivation of the plasmodia and the development of a technic. A fuller report[3] of this work has recently been made, and some interesting conclusions have been drawn or suggested. Bass and Johns were able to cultivate the parasites in human serum, in Locke's fluid from which calcium chlorid is omitted, and in human ascitic fluid. Positive cultures of the parasites have been made in the three forms of malaria and have been carried as far as four generations from the parent culture. The technic in the cultivation of a single generation differs somewhat from that for the cultivation of successive generations. The parasites will grow only in red blood-corpuscles, and it was found necessary to add dextrose to the culture-medium which seems to have a protective influence on the parasites within the red blood-corpuscles. When the parasites segment and escape from the red blood-corpuscles, they are immediately attacked and destroyed by the leukocytes, when these are present. The serum is also destructive of the parasites. In the cultivation of more than one generation, the leukocytes must be removed from the culture-medium, as otherwise the parasites are immediately destroyed at segmentation. Only the asexual cycle has been observed in the cultures, although there were indications that the sexual forms might also be cultivated.

It is the conclusion of Bass and Johns that the plasmodium in the blood of a patient can pass from cell to cell only when the cell is in direct contact with another cell containing a segmenting parasite, and then only when the opening for the exit of merozoites occurs opposite the cell to be infected. This probably occurs frequently in the small capillaries through which the non-segmented parasite cannot pass, its protoplasm being less yielding than that of the red blood-cells. It was found that blood drawn within one or two hours after a full meal was more serviceable for culture mediums than if drawn after fasting, which corresponds with the clinical observation that the parasites will often disappear in the blood and the paroxysms will cease if the patient is put to bed and given a purgative with a light diet. Calcium salts when added to the culture mediums were found to cause hemolysis of the infected as well as the non-infected cells, and the authors suggest this as an explanation of malarial hemoglobinuria, the amount of calcium salts in the blood being perhaps slightly augmented by the calcium in drinking-water or in food. Only a slight excess of calcium over the normal amount is required to produce this effect. Hemolysis from the calcium in non-infected, normal blood does not occur.

The experiments offer an interesting suggestion as to the way in which quinin acts in malaria. The authors believe that it does not directly kill the parasites but produces permeability of the red blood-cells with destruction of the parasites by the blood-serum. They suggest that their method of cultivation of the malaria parasite or some modification of it may be applied to the cultivation of other blood-cell parasites of man and animals. This fact and the suggestions regarding the mode of action of quinin, the influence of dextrose on the development of malarial parasites and the production of hemoglobinuria are really more interesting even than the fact that a technic has been developed for the cultivation of malarial plasmodia.

1. Bass, C. C.: THE JOURNAL A. M. A., Nov. 4, 1911, p. 1534.
2. Bass, C. C.: THE JOURNAL A. M. A., Sept. 21, 1912, p. 936.
3. Bass, C. C., and Johns, F. M.: Jour. Exper. Med., October, 1912.

Current Comment

HONOR TO WHOM HONOR IS DUE

Last week THE JOURNAL made several comments on the recent session of the International Congress on Hygiene and Demography and its influence on sanitary progress in this country. The section meetings, the exhibit, the creditable attendance from this and foreign countries, the public interest, the wide-spread and valuable educational publicity in the newspapers—these were the evident results. As is often the case, the cause is not so apparent. Yet any one who has been associated with any great task knows that no result is ever achieved without a proportionate amount of careful planning and painstaking effort on the part of some one. Those who have been most intimately connected with the management of the recent congress know that the principal cause of its successful outcome is found in the labors of Dr. John S. Fulton, the Secretary-General. For two years he has worked, unremittingly and conscientiously, to make the congress a gathering that should be a credit to the country in which it was held and to the scientific men of our land. How well he succeeded is now a matter of history. THE JOURNAL congratulates Dr. Fulton on the results of his efforts.

HUMAN HAPPINESS A BUSINESS ASSET

Human life is gradually becoming recognized as a business asset. This is a new fact in the development of the race. Life-insurance companies are realizing that they can increase their dividends faster by cutting down the death-rate than by increasing sales or by reducing expenses. Employers of large numbers of human machines are realizing the surprising fact that, as a cold business proposition, it pays, not in sentiment but in dollars, to take good care of their employees. Business men are learning that well-fed, well-clothed, contented men and women, working in well-lighted, well-ventilated quarters and on schedules arranged in accordance with our modern knowledge of psychology and physiology, actually turn out more work and better work than underpaid, discontented help, working under uncomfortable and insanitary conditions. Therefore large corporations are spending money liberally in playgrounds, rest-rooms, libraries, gymnasiums, sanitary lunch-rooms, moving-picture shows, safety devices, ventilating systems and similar devices for the well-being and enjoyment of their employees. If one asks these men why they are doing these things, they will disclaim any charitable or philanthropic motives. "This isn't charity," says one firm, "we want that clearly understood. This is simply good business management and common sense. A well man is of more use to us than a sick man. A happy, contented woman turns out more work and better work than an unhappy one. Therefore anything we can do to make the people who do our work at ease in mind and body we regard as good business management, just as we regard fire-insurance, improved machinery and labor-saving devices." The firms that have realized the enormous importance of this discovery are already reaping the benefits. The conservation of the health of employees will be a fundamental principle of good business management in the future. When it is fully recognized by the industrial world that sickness is a material liability and that health is a realizable commercial asset, contagion and preventable diseases will be hunted down and exterminated as relentlessly as modern industrialism now pursues counterfeiters, forgers and other commercial criminals.

DAIRYMAN'S RESPONSIBILITY FOR POISONOUS MILK

A dairyman in Atlanta, Ga., was fined $50 recently for violating the milk ordinance of that city. The dairyman, who ran a clean dairy, had permitted one of his drivers to purchase milk from another dealer in violation of the ordinance which requires milk-dealers to inform the health board of the source of all milk sold. The milk of the second dealer was not wholesome. An interesting angle was imparted to the case which may serve as a warning to milk-dealers who wish to avoid the expense of damage suits. One of the chief witnesses against the dairyman testified that his 2-year-old daughter had become seriously ill from ptomain poisoning caused by poisonous milk purchased from the dairyman on trial, and his testimony was corroborated by two physicians. The witness declared that if his daughter died the dairyman would be held responsible. The dairyman admitted that it was the practice of his drivers to purchase milk from other milk-dealers when their supply ran short. With this direct testimony that the illness was due to improperly inspected milk, it would seem that the dairyman might be held responsible in damages, though just what position a court or jury might take on the question is, of course, problematic. The case, however, suggests another forceful reason why the dairyman should comply not only with the ordinances as laid down, but with the measures which science and experience have proved to be essential to the production of safe milk. When he finds that his pocketbook may be touched in this way, he will be more ready to comply with the requirements.

MEDICAL EDUCATION IN ALABAMA

Reconstruction of medical education in the United States goes steadily on, and evidences of it are being received from all sections of the country. Of particular interest is the important readjustment recently made in Alabama, through the efforts largely of President George H. Denny of the University of Alabama, who displayed a thorough knowledge of the conditions and needs of medical education. For many years Alabama has had two medical schools, located respectively at Mobile and Birmingham. The former since 1897 has been recognized as the medical department of the University of Alabama and in 1907 by legislative enactment all its property was transferred to the university, which assumed complete control. The Birmingham school, realizing that without state aid or private endowment it could no longer teach medicine in accordance with the rapidly increasing requirements, recently offered to transfer its property to the university on condition that the work of the third and fourth years of the medical course be continued at Birmingham. This would mean that the work

of the first and second years would be given only at Mobile but that the work of the third and fourth years would be offered both at Mobile and at Birmingham, the student being allowed to choose between the two cities for his clinical instruction. In order that the university might secure full control of medical education in the state and yet avoid any unwise duplication of work, President Denny recommended that the Birmingham offer be accepted by the trustees of the university, but that instead of duplicating the clinical years of the undergraduate medical course, a postgraduate school be established at Birmingham and operated under the auspices of the university. With this understanding, which is said to have been satisfactory to both parties, the trustees voted to accept the Birmingham property. In accordance with the agreement, it is reported that undergraduate teaching will be discontinued at Birmingham after the three classes now enrolled have been graduated and that a postgraduate medical school will be developed there. Thus medical education in Alabama is to come entirely under the control of the state university, a parallel to what has already been done in Minnesota, Indiana, Colorado, Arkansas, Mississippi and Oklahoma. Alabama has gone further, however, in that provision has been made for the development of postgraduate medical instruction. It is to be hoped that nothing will interfere with this wise solution of the problem and that the rapid progress in medical education recently made in Alabama may continue unhampered.

HEALTH FOR SALE

One of the most interesting and important papers presented before the Fourth National Conservation Congress, which met last week in Indianapolis, was written, not by a physician or a sanitarian, but by a business man, Mr. E. E. Rittenhouse, of the Equitable Life Assurance Company. An abstract of his address appears in Society Proceedings in this issue. Mr. Rittenhouse, in the opening paragraphs of this address, recognized the crucial point in the present situation. He said: "It takes money to carry on a great educational movement and it takes money to conduct a public health service. The war between preventable disease and death is therefore a struggle between the dollar and the death-rate." These words should be placed before every citizen, for his instruction and as a warning. With our present-day knowledge of disease, good health is a commodity which can be bought, if our cities, counties and states are willing to pay the price. For $1.50 per capita per year, any community can practically banish those diseases which we now have the means of preventing and can greatly reduce the number of deaths from all causes. One dollar and a half per year! Not quite half a cent a day to save life from destruction by known causes! Three cents a week, twelve and one-half cents a month, to protect each man, woman and child from disease, which we know how to prevent and which we know will exact a toll of many lives during the next year and all succeeding years until proper preventive methods are inaugurated! A pitiably small sum, one thinks. Yet how much are our most advanced commonwealths spending for this purpose? Pennsylvania heads the list with 48 cents per capita, per annum; Arkansas, at the bottom, does not spend a cent; New York spends 1.7 cents; Massachusetts, 4.2 cents; Indiana, 1.8 cents; and so on. In 1911, fifty of the largest American cities with a total preventable death-list of 117,724, spent an average of 30 cents per capita to prevent disease, and $1.65 per capita to prevent fires. If we could have in every city as good a sanitary service as we now have fire protection, many lives that are now needlessly sacrificed could be saved. The people can have such protection if they want it and if they will pay for it. Safety from disease can be obtained just as we obtain safety from fire and from thieves. Health can be secured if society will foot the bill.

MORTALITY STATISTICS THREE YEARS OLD

If the title given above reminds our readers of the well-known song of "Bean Porridge Hot" the only apology that can be offered is that it is inspired by the receipt this week of the mortality statistics of the Bureau of the Census for 1909. The publication, nearly three years after date, of the great mass of statistical information regarding deaths in the registration area, is undoubtedly of scientific value to the student; but of what practical service is the distribution of this material long after the conditions which produced these deaths have passed away? It should be said, at once, in justice to the Bureau of the Census and its director, that the fault does not lie there. The material for this volume has been ready for months, but Congress did not appropriate money for its publication until recently. We understand that the responsibility lies directly on Congress, and no doubt to many members of Congress there is nothing absurd about printing mortality reports three years after they were compiled. But suppose the Weather Bureau did not publish its reports until three years had passed. Suppose the Department of Agriculture held back its crop reports until they were three years old. Suppose the Treasury Department sent to bankers, in 1912, reports on the gold reserve or the currency circulation or the bond issues in 1909. Would the financial world, the agricultural interests or the general public be satisfied? What the public and the sanitarians and physicians want to know is, what is the state of the nation's health to-day? What diseases are now causing loss of life and what dangers may be looked for and avoided? Statistics kept for three years before they are distributed may be interesting as historical data, but they are not particularly valuable as current information.

COOPERATION OF SCIENTISTS FOR SAVING LIVES

The creation by the American Medical Association and others of the Commission on Resuscitation from Electric Shock was announced early this year in THE JOURNAL.[1] A preliminary report of this commission has been issued in the form of a revised chart of instructions to be followed in case of accident, and a booklet containing practically the same matter as the chart. The chart is printed on heavy cardboard and is to be posted in all electric power-houses and other places

1. January 27, p. 282.

where injury from electric currents is possible. The booklet is for distribution to employees. While the high character of the work of this commission is most gratifying, the most important result of its appointment is the close cooperation which has been established between those interested in electric-light problems and the organizations representing the medical profession of the country and the electric engineers. If further evidence of the value of the work of this commission is needed, it is found in the request recently made by Dr. J. A. Holmes, director of the Bureau of Mines of the Department of the Interior, asking that the medical members of the commission serve on a similar committee on resuscitation from poisonous gases. This request has been granted by the Council on Health and Public Instruction, which, at the Atlantic City session, appointed Dr. Walter B. Cannon, Dr. S. J. Meltzer, Dr. Yandell Henderson, Dr. George W. Crile, Dr. Reid Hunt and Dr. Joseph Erlanger, to represent the American Medical Association on such a commission. This includes the medical members of the Commission on Resuscitation from Electric Shock, with the addition of Dr. Hunt and Dr. Erlanger. The official participation of the medical profession in cooperation with governmental, technical and commercial organizations in the solution of such problems indicates that in the future, medical scientists and medical organizations are to be invited to consultations on all questions affecting the lives and the health of the public.

HEMATINEMIA

The differentiation of the various derivatives of the blood-pigment, hemoglobin, which may arise under a considerable range of pathologic possibilities, has been helpful in the direction of accurate diagnosis. The deeply colored urines which, to the eyes of the older physicians, were a sign of an undoubted upset somewhere in the organism, even though the cause might be obscure or unfathomed, have acquired new meanings in the hands of the modern clinical chemist. With the aid of the spectroscope and a refined chemical technic he distinguishes between oxyhemoglobin, methemoglobin, hematoporphyrin and a further series of compounds, each of which has its peculiar import in pathologic history. The appearance of methemoglobin after poisoning with substances like chlorates, for example, or the elimination of hematoporphyrin after the excessive use of sulphonmethane (sulphonal), sulphonethylmethane (trional) and related drugs, has often given the clue to a successful solution of a difficult diagnostic problem and the initiation of appropriate remedial or prophylactic measures. A novel addition to pathologic chemistry has been made in the discovery of hematin in the blood of a patient suffering from acute chromium intoxication.[1] This derivative, representing the nonprotein fragment of the hemoglobin molecule, was found in the serum of the blood during a period of several days, while there were practically no other pigments in solution. Its formation must, of course, be ascribed to changes incident to the toxic destruction of red corpuscles and the liberation of pigment. The findings deserve additional comment because they emphasize the fact that whenever careful investigation is encouraged in the clinical laboratories of hospitals (as in this instance at the Allgemeines Krankenhaus in Hamburg-Eppendorf) scientific medicine is certain to profit by useful discovery.

1. Schumm, O.: Hämatinämie bei toxischem Blutkörperchenzerfall, Ztschr. f. physiol. Chem., 1912, lxxx, 1.

Medical News

COLORADO

Personal.—Dr. and Mrs. William Frederick Slocum, Colorado Springs, have returned from Europe.——Dr. Charles Adams Holder, formerly of Colorado Springs, U. S. Consul at Rouen, France, for the last three years, has been appointed United States Consul-General for Norway with headquarters at Christiania.

New Tuberculosis Pavilion.—A new pavilion for tuberculosis patients is to be erected at the Union Printers' Home, Colorado Springs. This improvement will cost $10,000. The trustees have also decided to build two stories over the library annex at a cost of $25,000, to be used for hospital purposes, and other improvements amounting to $5,000.

Women Physicians Hold Meeting.—The Women's Colorado State Medical Association held its annual meeting and banquet at Pueblo, September 25, and elected the following officers: president, Dr. Ella Mead, Greeley; vice-presidents, Drs. Jessie Stubbs, La Junta, and Mary Stratton, Denver, and secretary-treasurer, Dr. Kate E. Yont, Denver.

State Society Meeting.—At the forty-second annual meeting of the Colorado State Medical Society held in Pueblo, September 24-26, the following officers were elected: president, Dr. J. A. Black, Pueblo; vice-presidents, Drs. C. E. Edson, Denver; W. H. Halley, Rouse; H. A. Calkins, Leadville, and C. A. Ringle, Greeley; councilors, Drs. H. G. Wetherill, Denver, and A. R. Pollock, Monte Vista, and delegate to the American Medical Association, Dr. W. A. Jayne, Denver.

DISTRICT OF COLUMBIA

Personal.—Dr. V. B. Jackson has returned from Europe.——Dr. Thomas B. Kramer fell from a street car recently, dislocating his left shoulder.——Dr. L. B. Kline has started for the Philippine Islands where he will open a hospital at Vigan, Luzon, under the auspices of the Christian Foreign Missionary Society.

More Light in Medicine.—The Medical Society of the District of Columbia is continuing its series of public lectures on health topics. The object of the society is to give the public direct and accurate instruction with regard to the health of body and mind, and to minimize the public danger due to unwise procedures based on partial knowledge or misinformation.

ILLINOIS

State Tuberculosis Association.—The Illinois Association for the Prevention of Tuberculosis will meet at Springfield, October 19, this meeting being held in conjunction with that of the Illinois State Conference of Charities and Correction. The chief subject for discussion will be "Antituberculosis Work in the Smaller City" and the speakers will be Drs. J. W. Pettit, Ottawa, and George T. Palmer, Springfield. A part of the day will be spent in inspecting the dispensary and visiting nurse service of the Springfield Tuberculosis Association.

Chicago

Personal.—Dr. Clarence L. Wheaton has been appointed physician in charge of the male service at the Chicago-Winfield Tuberculosis Sanatorium.——Dr. Charles P. Small has resigned as university physician to the University of Chicago, and will hereafter devote his entire time to his special line of work.

INDIANA

Campaign for Incurable Tuberculosis Patients.—A three-day campaign to raise $10,000 for a camp for incurables at the Antituberculosis Farm, Evansville, was carried on by the local antituberculosis society, October 1-3.

New Officers.—Younger Physicians' Club of Indianapolis, September 26: president, Dr. John W. Carmack; secretary-treasurer, Dr. D. W. Fosler.——Thirteenth District Medical Society, at South Bend, September 18: president, Dr. H. F.

Mitchell, South Bend; secretary-treasurer, Dr. C. M. Howard, Warsaw. The next meeting will be held April, 1913, at Goshen.——Huntington Association for the Study and Prevention of Tuberculosis, organized at Huntington, September 24: president, Dr. W. C. Chaffee; secretary, Mary Baker, both of Huntington.

Personal.—Dr. George D. Kahlo, professor of medicine in Indiana University and formerly medical director of the French Lick Springs Hotel, has been elected medical director at White Sulphur, W. Va. Dr. Kahlo sails this month for Europe.——Dr. A. P. Roope and family, Columbus, have returned from abroad.——Dr. Wm. W. Hoggatt, French Lick, was seriously injured in an automobile accident at Indianapolis, recently.——Dr. W. H. Hoppenrath, Elwood, was attacked by highwaymen near Indianapolis, September 17, but succeeded in repelling the attack.——Dr. A. K. Hammond, Fort Wayne, sustained painful bruises in an automobile accident, September 17.——Dr. Eric A. Crull, secretary of the Fort Wayne Board of Health, has been appointed surgeon for the Fort Wayne Mercantile Association, vice Dr. A. P. Buchman, resigned.

MARYLAND

New Officers.—Georges Creek Medical Association at Frostburg, September 20: president, Dr. W. Oliver McLane; secretary-treasurer, Dr. T. L. Conroy, both of Frostburg.

Nurses' Home for Frederick Hospital.—Work has been commenced on a nurses' home for the City Hospital, Frederick. The building, which is to be 62 by 35 feet, is the gift of Mrs. Georgia Simmons.

Pumps Condemned.—The State Board of Health is waging war against pumps and wells of Baltimore County. More than seventy pumps have thus far been condemned and posted and their handles chained. The board is trying to check the prevalence of typhoid in Towson and vicinity.

Baltimore

Fresh-Air Hall Fund Grows.—Up to September 16, $9,258.70 had been subscribed for the erection of a new recreation hall at the Fresh-Air Farm, Fallston.

The Herter Lectures.—The seventh annual course of lectures of the Herter foundation was delivered by Dr. George H. F. Nuttall, Quick professor of biology in the University of Cambridge, England, October 8-9-10, on spirochetosis, trypanosomiasis and piroplasmosis, each lecture being illustrated by lantern slides and specimens.

Personal.—Dr. James J. Mills has returned from Europe.——Dr. G. C. Battles has resigned as resident physician to the Municipal Hospital for Tuberculosis on account of ill health and has been succeeded by Dr. Louis Friedman, New York. Dr. James Murray has also been appointed assistant physician of the institution.——Dr. William H. Welch entertained a number of members of the International Congress on Hygiene and Demography at the Maryland Club, September 30.——Professor Ernest Zueblin delivered the address at the opening session at the University of Maryland on "Attitude of the Student and Conditions Necessary to Success, and the Methods to Be Employed."

Faculty Appointments.—The following appointments have been made on the medical faculty of Johns Hopkins University: Dr. Herbert M. Evans, formerly associate, to associate professor in anatomy; Dr. Charles R. Essick, formerly instructor, to associate in anatomy; Dr. Edward H. Richardson, formerly instructor, to associate in gynecology; Dr. Thomas P. Sprunt, formerly instructor, to associate in pathology; Dr. Samuel J. Crowe, formerly assistant, to associate in surgery; Dr. Lloyd P. Shippen, formerly assistant, to instructor in hygiene and bacteriology; Dr. Henry A. Stephenson, formerly assistant, to instructor in obstetrics; Dr. David M. Davis, assistant in pathology; Dr. Henry H. Hazen, assistant in dermatology; Dr. George B. Jenkins, assistant in anatomy; Dr. Roy D. McClure, assistant in surgery; Dr. Everett D. Plass, assistant in obstetrics; Dr. Holland N. Stevenson, assistant in pathology.

NEW JERSEY

Sanitary Cups Obligatory.—The supreme court of New Jersey sustained an order to the Public Utility Commission, October 4, requiring railroad companies supplying drinking water on trains to passengers to provide a sanitary drinking-glass or individual drinking-cup.

Diphtheria in Camden Decreased.—After a conference between Dr. H. J. Davis, chief medical inspector of the Camden public schools, and Dr. J. F. Levitt, medical inspector of the Board of Health, it was announced that all danger of the epidemic from diphtheria in East Camden was passed. There are but nine cases now in the infected district and all are recovering. The schools, however, will not be opened until October 14 and services in churches and Sunday-schools are still discontinued.

NEW YORK

Needs of State Hospital.—An appropriation of $365,000 for new buildings and needed repairs at the State Hospital for the Insane, Binghamton, is to be asked from the legislature at its next session.

New Dispensary for Syracuse.—The trustees of Syracuse University have voted to establish a dispensary in connection with the College of Medicine. A portion of the dispensary will be used for social service work. Work will be started on the building in the near future.

Association Approves Mayor.—The Rochester Public Health Association has addressed a letter to Mayor Edgerton expressing its deep appreciation of his valuable cooperation and assistance at all times and especially at the time of the Health Field Day, August 10.

Personal.—Dr. Edgar A. Nugent, Unionville, suffered a fracture of the right hip in an automobile accident, September 21.——Drs. Hersey G. Locke and H. L. Elsner, Syracuse, have been appointed members of the Committee on Experimental Medicine of the Medical Society of the State of New York.——Dr. S. S. Ham has been appointed a member of the medical staff of Ellis Hospital, Schenectady.

Sanatorium May Be Reopened.—The Mountain Sanatorium, Binghamton, which was closed by order of the mayor, September 28, may be reopened as the president of the Colorado Fuel and Iron Company has made the following offers to the city: either to lend money without interest to keep the institution open until Jan. 1, 1913, or if such a loan cannot be legally accepted, to contribute direct one-fourth of the expense of keeping the institution open until that date.

County Tuberculosis Hospitals.—Already twenty-one counties of the state have decided to build tuberculosis hospitals under the county hospital law passed in 1909. It is expected to bring the number up to thirty before the end of the year.——The Board of Supervisors of Westchester County has voted to purchase a site for $40,000 for its new tuberculosis hospital which will cost about $100,000.——County hospitals will soon be opened in Fulton, Montgomery, Tompkins and Oswego Counties.

Hospital Notes.—The cornerstone of the new Mount St. Mary's Hospital, Niagara Falls, was laid September 29 by Bishop Colton with impressive ceremonies. The building is to be made of cut stone and shale brick, will accommodate 125 patients and will cost about $300,000.——The new German Deaconess Hospital, Buffalo, was opened for inspection October 1 and was formally dedicated October 6. It is believed that the old building of the hospital will be continued as an annex to the newer institution.

New York City

Selling Cocain to Children.—The proprietor of a Brooklyn saloon and three other men were arrested recently for selling cocain, opium and heroin to school children in the Bedford and Bushwick sections. More than 500 packages of the drugs were seized. It is said that the drugs were sold on the street corners for as little as five cents. The offenders were held in $5,000 bail.

Cancer Home Appeals for Funds.—St. Rose's Free Home for Cancer which has just completed a new $100,000 building has been embarrassed because of a rumor that the building had been entirely paid for. This was not the case, there being a mortgage of $45,000 on the property. An urgent appeal has been made not only for money to raise the mortgage but for $25,000 to meet the expense of furnishing and maintenance.

Personal.—Dr. E. F. Bashford, director of the Imperial Cancer Research Fund of England, delivered two lectures on "Cancer" at the New York Academy of Medicine, one on the evening of October 2 and one on October 5.——Prof. Max Rubner of Berlin delivered the Wesley M. Carpenter Lecture at the New York Academy of Medicine on the evening of October 3, his subject being "The Life of a Cell."——Dr. and Mrs. G. A. Hull, Dr. and Mrs. J. E. L. Davis and Dr. and Mrs. Augustus B. Wadsworth have sailed for Europe.——Dr. and Mrs. L. J. Waterman, Brooklyn, have returned from Europe.

Foreign Physicians Lecture.—Prof. H. Straus of the University of Berlin will lecture in German at 4 p. m., October 14, on "Gastric Secretion from the Therapeutic Point of View;" at

the same hour on October 15 on "The Method and Purpose of Dechlorination in Nephritis." Prof. C. von Noorden of the University of Vienna will give a series of lectures in English on "New Aspects of the Pathologic Treatment of Diabetes," and on "Diagnosis and Treatment of Nephritis," beginning October 29 at 4 p. m. and continuing for four consecutive days at the same hour. These lectures will be delivered at the New York Postgraduate School and Hospital.

Tuberculosis Blamed for Poverty.—The New York Association for Improving the Condition of the Poor has just announced the results of the investigation of 6,565 families that sought aid of the association between Oct. 1, 1911, and June 30, 1912. Of this number 1,605 sought aid because of illness, and the illness in 555 families was tuberculosis. This would indicate that 8 per cent. of the destitution in the homes of the city during the above named period was due to tuberculosis. The association says that some effective plan of home treatment must be found, because it will be many years before there will be enough hospitals to accommodate all the tuberculosis patients, in spite of the excellent work that is being done. A comparison of the hospital provisions in the United States with the needs and growth of population shows that the demand is increasing twice as fast as the supply.

PENNSYLVANIA

Homeopathic Insane Hospital Opened.—After a summer of preparation, the Board of Trustees of the State Homeopathic Insane Hospital, Rittersville, opened the male ward of the institution, October 1. This will accommodate 225 patients. The female ward is nearly ready for occupancy.

Statistics on Epilepsy Wanted.—The Commission on the Segregation, Care and Treatment of the Feeble-Minded and Epileptics desires to obtain information as to the relative prevalence of feeble-mindedness and epilepsy, and as to the total number of these defectives who are not receiving institutional care.

New Officers.—Fourth Censorial District Society at Harrisburg, September 17: president, Dr. J. Henry Musser, Lampeter; secretary, Dr. H. C. Kinzer, Lancaster.——Seventeenth Censorial District Society, at Danville, September 5: president, Dr. Harvey M. Becker, Sunbury; secretary, Dr. Luther B. Kline, Catawissa.

Hospital Endowed.—Mrs. A. A. Geisinger, Danville, has announced that she will give $600,000 for the establishment of a hospital in that city to be known as the George F. Geisinger Memorial Hospital. Of this amount, $100,000 is to be used toward the cost of the building, while the balance of $500,000 will be held as an endowment fund.

Typhoid in Norristown.—Fourteen additional cases of typhoid fever were reported to the bureau of health, Norristown, October 3. The health officer, Dr. White, declares that eleven of the cases are due to drinking milk from a dairy at Limerick, where conditions were found not of the best. Since the investigation no milk from this dairy has been sold in Norristown.

State Medical Meeting.—The sixty-second annual convention of the Medical Society of the State of Pennsylvania was held at Scranton, September 23-26. The trustees convened Monday afternoon, September 23. The first general meeting was called Tuesday morning by the president, Dr. James M. Tyson, of Philadelphia, and the delegates were welcomed by Mayor von Bergen and Dr. Rowland W. Davis, president of the Lackawanna County Medical Society. Dr. Tyson was presented with a gavel made of coal and a feature of the first day was a paper on medical expert testimony from a legal standpoint by Attorney Francis F. Kane, of Philadelphia. The seventh annual banquet and conference of secretaries of the component county societies was held that evening at the Hotel Jermyn. Dr. Luther B. Line of Catawissa was toastmaster. On Thursday evening a dinner was given to the visitors followed by a reception and dance. A resolution was adopted disclaiming responsibility by the society for criticisms of the State Department of Health made by one speaker. The following officers were elected: president, Dr. Lewis H. Taylor, Wilkes-Barre; vice-presidents, Drs. A. A. Long, York; David Strickland, Erie; M. Howard Fussell, Philadelphia, and J. C. Gilland, Greencastle; secretary, Dr. Cyrus L. Stevens, Athens (reelected); assistant secretary, Dr. William H. Cameron, Pittsburgh; treasurer, Dr. George W. Wagoner, Johnstown, and delegates to the American Medical Association, Drs. William R. Davies, Scranton; J. B. McAlister, Harrisburg; William T. Hamilton, Philadelphia, and T. E. Davis, Pittsburgh.

Philadelphia

Steamer Detained at Quarantine.—Because of the discovery of a suspected case of small-pox in one of its passengers, the German steamer *Graf Waldersee* was detained at the Reedy Island Quarantine, September 21.

Hospital Buys Lots.—The Kensington Hospital for Women has purchased three dwellings, each 15 by 32 feet, at the southwest corner of Fontain and Waterloo Streets, for a nominal consideration. The lots will be used for the enlargement of the hospital.

Medical Club to Honor Mayor.—The Medical Club of Philadelphia has announced that it will give a reception in honor of Hon. Rudolph Blankenburg, mayor of Philadelphia, Friday, October 18, at the Bellevue-Stratford.

Pier Hospital Closes.—The official closing of the hospital for babies on the Chestnut Street Pier took place September 28. Since the opening of the hospital, June 16, more than 1,000 babies have been treated. The daily average attendance was eighty babies. Dr. S. W. Newmayer was the chief physician and the hospital force consisted of three nurses under the supervision of Miss C. E. Perkins.

Students' Physicians Appointed.—Announcement has been made that Dr. Rufus B. Scarlett and Dr. William F. Guilfoyle have been appointed students' physicians at the University of Pennsylvania and students are urged to report to them when ill. Provost Edgar F. Smith, in a circular letter, has advised parents and guardians of every student at the university of the provisions made for looking after the health of students and requested that each student bring a report of his general physical condition from his family physician or obtain such from Drs. Scarlett and Guilfoyle.

Break Ground for Museum.—September 24 ground was broken by Dr. Edgar F. Smith, provost of the University of Pennsylvania, and former mayor Weaver, for the Thomas W. Evans Museum and Dental Institute, at Fortieth and Spruce streets. The ceremonies were attended by the deans of the University of Pennsylvania, members of the faculty of the University Dental School, representatives of the various dental alumni associations and the French and English consuls. The building is expected to be completed in the fall of 1913 and, according to the plans, will be the largest and best equipped dental school in the world, supported by an endowment of $600,000. The building will cost about $500,000. The Museum and Dental Institute will be under the administration of the university. Dr. Evans, the famous Paris dentist in Louis Napoleon's reign, was a former Philadelphian who died in Paris in 1897.

TEXAS

New Hospitals.—Dr. L. Mackechney has planned a new hospital in the Kemp home, Wichita Falls.——A modern city hospital is to be erected in North Dallas at a cost of about $100,000.——The Kings Daughters' Hospital which has been erected at a cost of $40,000 at Temple was thrown open for public inspection, August 23. The new building contains thirty-five rooms for patients together with the necessary operating-rooms and administration offices.——The Wayland Building, Plainview, is being remodeled and will be converted into a hospital.

Sanatorium Notes.—Plans have been presented to the Dallas city and county commissioners and physicians of the city and county for the proposed tuberculosis hospital to be erected on the old Union Hospital site, north of the city. The estimated cost of the buildings is about $30,000. The plans call for three connected buildings with a total length of 430 feet.——Lakeside Sanatorium, San Antonio, was incorporated August 22, with a capital stock of $20,000, by Drs. Thomas M. Dorbandt and M. A. Forbes.——Construction work was begun, August 20, on the Hospital for the Treatment of Children Suffering from Tuberculosis of the Bones, Galveston. The hospital is being built under the direction of the Texas branch of the National Association for the Study and Prevention of Tuberculosis.——Plans have been revived to establish in Waco an infirmary for incurable tuberculosis patients, the cost to be borne jointly by the city of Waco and McLennan County.——The Houston Antituberculosis League has established in the basement of the county courthouse a free dispensary for the treatment of tuberculosis patients, and asks the city and county to contribute each $7,500 toward the erection of a tuberculosis sanatorium.——State Tuberculosis Colony No. 1, Carlsbad, was opened for occupation and service July 16 and twenty-six patients have been received. Dr. Bascom Lynn, the superintendent, is asking for an additional appropriation of $90,475 to construct dormitories and cottages, and to provide other extensive improvements.

UTAH

Personal.—Dr. C. F. Osgood, Ogden, was held up in his office September 8, and robbed of $55.——Dr. George Roberts, intern at St. Mark's Hospital, Salt Lake City, who has been ill in that institution, is reported to be convalescent.——Dr. M. R. Stewart, Salt Lake City, has returned from Europe.

New State Society Officers.—The annual meeting of the Utah Medical Association was held in Ogden, September 24-25 and the following officers were elected: president, Dr. Andrew J. Hosmer, Salt Lake City; vice-president, Dr. R. A. Pearse, Brigham; secretary, Dr. W. Brown Ewing, Salt Lake City; treasurer, Dr. H. P. Kirtley, Salt Lake City, and councilor for the second district, Dr. R. C. Smedley, Salt Lake City. The association decided to hold its meeting next year in Salt Lake City.——At the annual banquet Dr. A. S. Condon, Ogden, in his address, linked the National League for Medical Freedom with subsidized newspapers and declared that the league was merely a combination of "patent-medicine" manufacturers who had bought up the newspapers with expensive advertising and had subsidized the opponents of the Owen bill with enormous amounts of money. A resolution was adopted regretting that the senators and representatives from Utah, who, during the pending of the so-called Owen bill, stood aloof from it with indifference and openly opposed it when it was manifestly their duty to defend and advocate it, inasmuch as it is not only in the interests of their constituents, but also, in a larger sense, of those who seek to conserve the most vital question that ever confronted the public in general, namely the conservation of our sanitation and the protection of our seaports against the invasion of foreign epidemics and diseases.

VIRGINIA

Hospital Opened.—The Rockingham Memorial Hospital, Harrisonburg, which has been in course of erection for four years, was opened to the public October 1 with formal ceremonies. The hospital site adjoins the State Normal School grounds and the building has been erected at a cost of $30,000. Of this $20,000 was bequeathed to the institution by William G. Leake, Harrisonburg.

Personal.—Dr. George C. Hall, New York City, has been appointed assistant medical director of the Life Insurance Company of Virginia, Richmond.——Dr. R. L. Robertson has been appointed health officer and Dr. J. E. Earley, school trustee of Charlottesville.——The ancestral home of Dr. John Winn of Richmond, fourteen miles from West Union, was struck by lightning September 7, and considerably damaged. ——The residence of Dr. and Mrs. James D. Stearnes, Dublin, was destroyed by fire, September 6.

WISCONSIN

Personal.—Dr. George T. Hegner has resigned from the staff of the Emergency Hospital, Milwaukee, and will practice in Appleton.——Dr. John R. McDill, who has been in the Philippine Islands for twelve years, has returned and will resume practice in Milwaukee.——Dr. N. I. Tibbits, Peshtigo, who has disposed of his practice and has moved to Grand Rapids, was given a banquet by the local lodge of Knights of Pythias, recently.——Dr. G. N. Hidershide, Arcadia, has started for Europe.

Reorganization of Child Welfare Work.—A reorganization of the child welfare work in Milwaukee has been effected. The Child Welfare Station, formerly on Eighth Avenue, has been abandoned and new quarters have been secured in the Fifth Avenue School, near Hays Avenue. The advisory staff has been selected by Dr. E. T. Lobedan, director of the board, consisting of Drs. H. Wagoner, Irene Tomkiewicz, J. A. Birkl, A. R. F. Grob, J. N. Rock, H. Gramling, A. A. Krygier, L. Bradstead, L. J. Drozniakiewicz and S. A. Baranowski.

GENERAL

New Hospital for Manila.—The cornerstone for a Spanish hospital has just been laid in Manila by Acting Governor-General Newton W. Gilbert. The site of the institution is on Calle Sandejas, and of the $35,000 required for its construction more than $20,000 is already in hand.

Croat Hospital Planned.—At the annual meeting of the National Croatian Society held recently in Kansas City, Kan., the proposition was discussed of buying several hundred acres of land in Kansas or some other southwestern state, on which to establish a hospital for the care of Croatians suffering from tuberculosis.

Public Health Inspections of Common Carriers.—The Secretary of the Treasury issued a general order October 6, directing all commissioned medical officers of the United States Public Health Service when traveling under official orders to make inspections of the sanitary conditions of the trains and vessels on which they travel and of the stations, terminals and wharves at which they stop. Congress authorized this inspection but failed to appropriate funds to carry it out.

Hospital Authorities Meet.—At the annual meeting of the American Hospital Association held in Detroit, September 25-27, the following officers were elected: president, Dr. Frederick A. Washburn, Massachusetts General Hospital, Boston; vice-presidents, Dr. W. P. Morrill, Winnipeg (Man.) General Hospital, and Mabel Morrison, Robinwood Hospital, Toledo; secretary, Dr. J. N. E. Brown, Detroit General Hospital (reelected), and treasurer, Asa Bacon, Presbyterian Hospital, Chicago (reelected).

Prevention of Infant Mortality.—At the third annual meeting of the American Society for the Study and Prevention of Infant Mortality held in Cleveland, October 2-4, the following officers were elected: Dr. L. Emmett Holt, New York City; president-elect, Dr. J. Whitridge Williams, Baltimore; vice-presidents, Dr. Isaac A. Abt, Chicago, and Arthur M. Baldwin, Cleveland; secretary, Dr. Philip Vaningen, New York City; treasurer, Austin McLanahan, Baltimore, and executive secretary, Miss Gertrude B. Knipp, Baltimore (reelected).

Bequests and Donations.—The following bequests and donations have recently been announced:

Jewish Consumptives Relief Society, Jefferson County, $6,000 for the erection of a laundry building and $200 a month for its maintenance by Mr. and Mrs. S. Fishbaum, Chicago.

Craig Colony for Consumptives, Jefferson County, Colo., $3,400 by the sale of flowers in Denver, August 13.

Children's Hospital Association, Denver, $3,650 by the annual Fête Day at Elitch Gardens.

Methodist Hospital, Indianapolis, $20,000 by the will of Mrs. Susan Dixon, Shelbyville; eighty acres of land, said to be worth $150 per acre by the will of Mrs. Simeon Smith, Bloomfield.

Eagleville (Pa.) Sanatorium for Consumptives, $5,000; Frederick Douglas Hospital, $2,500; Jewish Maternity Hospital, $2,500; Mt. Sinai Hospital, $2,500 by the will of Samuel Kohn.

German Hospital, Philadelphia, $1,000 by the will of John G. Hess.

Presbyterian Hospital, American Oncologic Hospital and Home for Female Consumptives, Philadelphia, each $500 by the will of Elizabeth Gorne.

Presbyterian Hospital, Philadelphia, $5,000; Episcopal Hospital, Philadelphia, $10,000, $5,000 of which is to install a free bed in memory of the husband of the testator, by the will of Mrs. Ida S. Whitman.

Presbyterian Hospital, St. Agnes Hospital, St. Joseph's Hospital, Pennsylvania Hospital and Jewish Hospital, Philadelphia and White Haven Sanatorium of the Free Hospital for Poor Consumptives, $5,000 each, for the establishment of free beds, to be known in each instance as the "Bartholomew Shea free bed," by the will of Mariah Mellon.

Beth Israel Hospital, Philadelphia, $15,000; Mount Sinai Hospital, Philadelphia, Lebanon Hospital, Sanatorium for Hebrew Children, Hospital for Deformatives and Joint Diseases and Jewish Maternity Hospital, each $2,500 by the will of Nathan Herman.

Cary Memorial Hospital, Caribou, Me., $125,000 for establishment and endowment by the will of Dr. Jefferson Cary.

New York Academy of Medicine, the library of the late Dr. James B. Newcomb.

Littleton (N. H.) Hospital, $1,000 for the George B. Gleaner fund.

LONDON LETTER

(From Our Regular Correspondent)

LONDON, Sept. 27, 1912.

The National Insurance Act

In the deadlock between the profession and the government concerning the medical benefits of the national insurance act the hostility of the friendly societies to the profession's demands is once more in evidence. The government is in the unfortunate position of being between two fires, and has aroused in an acute form the old quarrel of the profession with the societies. It has long been the object of the British Medical Association to modify the unsatisfactory conditions of contract practice, but the disunion of the profession rendered its efforts vain. Now opposition to the insurance act has united the profession and brought the struggle to an issue. It may be remembered that the government offered the physicians a capitation fee of $1.50 for medicine and attendance and that the physicians demanded $2, as well as a long list of extras. As the friendly societies at present pay less than the government terms, they are very hostile to the physicians' demands.

Considerable interest attaches to the annual National Conference of Friendly Societies, which is now being held at Newcastle-on-Tyne. In his inaugural address, the president complained that no light could be obtained from the insurance commissioners as to the present position The various societies made overtures for the capitation fee of $1.50 to be paid over to them should the physicians fail to come to terms with the

government, so that the societies could deal with the doctors directly, but the request was not favorably considered. At present the commissioners were discussing various systems: (1) capitation system; (2) capitation system plus payment for special services; (3) payment by attendance; (4) fees and capitation system plus payments for special services. All these will, it appears, be included in general regulations with options to the local insurance committees to adopt any combination of them they may see fit. Thus, the president complained that nine months after the passing of the act the warfare as to price which had been waged between the government and the physicians is to be transferred to every local insurance committee for settlement without any lead. This, in his opinion, imposed a responsible duty on every member of the committees representing insured persons—to oppose strenuously any additional cost for medical benefits. Care was especially necessary as regards the wage limit of $10 a week demanded by physicians. Parliament refused to put this in the bill and it would be a bone of contention on every insurance committee.

Trade Unionists and the British Medical Association in Australia

In Western Australia the British Medical Association has received the support of local trade unionists in a manner which is unprecedented in the old country, where these organizations regard the attempt to establish a "standard wage" with anything but sympathy. Recently the Yarloop Hospital Committee was told by its medical officer that in consequence of regulations of the Western Australian Branch of the British Medical Association governing the conditions under which members might contract with benefit societies, hospitals, etc., it would be necessary for his allowance to be increased. The hospital committee found that on the present contribution of about $1 per month per member they could not meet the demand. At the half-yearly meeting the committee's report was the principal subject for discussion. A large number of subscribers journeyed from all parts to attend. The majority were members of the timber workers' union. They soon showed that they intended to support what they termed their "union doctor." One prominent unionist expressed delight at the fact that the physicians were, through their union, endeavoring to establish a minimum wage. It was decided to bring the physician's allowance up to the stipulated rate and authority was given to the committee to make, if necessary, a further demand of 12 cents from each member.

PARIS LETTER

(From Our Regular Correspondent)

PARIS, Sept. 20, 1912.

French Health Statistics

Since 1906 French health statistics have covered the whole country, but previous to that year did not include towns of less than 5,000. According to the latest report published, the total deaths since 1906 have been as follows: 1906, 778,400; 1907, 793,467; 1908, 744,694; 1909, 755,442; 1910, 704,770. The number of deaths per thousand of population has been:

	Towns of More than 5,000.	Places of Less than 5,000.	France as a Whole.
1906.....	20.67	19.39	19.86
1907.....	21.18	19.70	20.21
1908.....	20.27	18.27	19.00
1909	20.61	18.50	19.27
1910.....	19.38	17.18	17.98

A study of the statistics shows that there have been more deaths in the towns of more than 5,000 inhabitants than in those of less than 5,000, excepting from malaria, grip, acute bronchitis, pneumonia, diseases of the stomach (except cancer), conditions incident to pregnancy and childbirth, congenital debility, violent death, senility and unknown diseases. Deaths from old age are more numerous among persons living in the country than in towns. In towns of more than 5,000 there were 18,318 deaths from old age, or 1.28 per thousand, and in towns of less than 5,000, 83,643 deaths, or 3.35 per thousand. Diseases which were responsible for more deaths in the towns than in the country were typhoid fever, measles, tuberculosis (3.30 per thousand instead of 1.51), infantile diarrhea (0.81 as against 0.52), and acute nephritis (0.53 as against 0.17).

The report is comparatively satisfactory as regards epidemic diseases, although efforts should be increased to check typhoid fever. Epidemic diseases in 1910 caused 22,095 deaths out of 704,770, or 3.17 per hundred deaths, which is less than deaths caused by violence, 27,320; infantile diarrhea, 24,652; congenital debility, 22,719; cancer, 31,303, and much less than tuberculosis, 85,088. Efforts to reduce infant mortality have been markedly successful: from 1906 to 1910 the deaths per thousand among infants up to 1 year of age have been reduced from 135 to 100; in Paris from 1887 to 1890 the infant death-rate up to 1 year was about 300; from 1896 to 1900 it was 201, and from 1901 to 1905 it was 156. In 1910 it was but 111. Malignant tumors are as wide-spread a cause of death in France as in other countries; the death-rate from 1906 to 1910 from this cause was 70, 75, 77, 78 and 80 per hundred thousand population. In 1910 it was 107 in towns of more than 5,000 and 64 in others. The total number of deaths from malignant tumors has increased from 27,306 to 31,303 in this period. The comparative death-rate from this cause in 1909 is as follows: France, 78; Spain, 50; Italy, 63; Belgium, 64; England, 85; Germany, 95; the Netherlands, 102, and Switzerland, 127.

The general death-rate in France is higher than it ought to be, taking into consideration its climate, prosperity and the enlightenment of the people. It is not so small as the death-rate of Europe as a whole and of Italy, but is less than that of Germany, Switzerland, Belgium, and much less than that of Great Britain and the Netherlands. Tuberculosis is the chief reason why a better showing is not made. Tuberculosis does not cause 150,000 deaths per year, as has been said so often, but there were 85,088 deaths from it in 1910, of which 37,838 occurred in towns of less than 5,000 and 47,250 in towns of more than 5,000. The report emphasizes the fact that the highest death-rate from tuberculosis occurs in those departments in which the greatest amount of alcohol is consumed.

The Medical Corps in the Army Maneuvers

The maneuvers which have just ended in the West were participated in for the first time by a number of medical corps attached to an infantry division. Until this year, for reasons of economy, the medical corps took no part in the army maneuvers. As a result the medical officers had no experience in the field and were likely not to be equal to assuming responsibilities when called on in time of need. The medical corps this year was given field practice as a result of recent discussions in the Chamber of Deputies, which brought to light the fact that in the Morocco expedition the medical corps had been handicapped by lack of experience.

In the maneuvers a new organization of the field medical service was tried for the first time. Heretofore the army medical service has been divided, for the purpose of being near the firing-line and for carrying and treating the wounded, into an ambulance corps for each infantry division and an ambulance corps and eight field hospitals for each army corps. According to the new plan the old ambulance corps and field hospitals have been superseded by a number of light units, equipped like one another so as to be interchangeable, and consequently able to follow the troops in their maneuvers and to consolidate after a battle to carry on the work of caring for the wounded which they have picked up. The new formations are called ambulance corps and hospital sections, the latter being equipped with the means for doing actual hospital work.

BERLIN LETTER

(From Our Regular Correspondent)

BERLIN, Sept. 21, 1912.

The Blind in Prussia

In the period between the census of 1905 and 1910, according to recently published official statistics, the number of the blind in Prussia has been reduced not only relatively but absolutely. For 10,000 inhabitants there were in 1910 only 5.2 blind, whereas in 1905 there were 5.6 and in 1880, 8.2. The male population has always been somewhat more affected than the female. As to the age of the blind, the middle and old age classes show many more blind than the younger classes. Among 10,000 inhabitants there were in 1910 only 0.8 under 5 years (1905: 0.8); under 10 years 1.4 (1.2); from 20 to 30 years 2.7 (2.8); from 50 to 60 years 9.8 (10.8); from 60 to 70 years 18.3 (19.7), and over 70 years 49.7 (5.54). The increase in numbers of the blind in advanced life is associated with the occurrence of other afflictions besides their eye disease. In 1910 of the 20,953 blind, 18.57 per cent. were inmates of institutions. Of those who were cared for in institutions the merely blind formed the smallest proportion, namely, 17.95 per cent.; the insane blind, on the other hand, amounted to 37.94 per cent.; the deaf and dumb and blind to 22.7 per cent., and such blind persons as were deaf and dumb and imbecile formed 40.85 per cent.

Statistics of Causes of Death in Bavaria for Thirty Years

It is well known that in the last three decades the death-rate in general has been materially reduced. From 1881 to 1885 there died on the average yearly from puerperal fever, 26.4 per 10,000 puerperæ. From 1906 to 1910, on the other hand, there died yearly only 14.9 per cent. per 10,000. The scarlet fever mortality has declined in the thirty years from 45.6 per cent. per 100,000 of population to 7. The reduction in the mortality from measles and rötheln is not so pronounced. This disease is characterized by marked variations in the individual years.

The mortality from diphtheria and croup has been very materially reduced from 122.2 per 100,000 of population to 51.8. How effective the treatment of this disease with antitoxin is may be seen by comparison between the years immediately before and after the discovery of this remedy (1894). There died from diphtheria and croup in 1893, 8,695 persons; in 1894, 4,894; in 1895, only 2,769; in 1896, 2,290, and in 1897, 1,848. Even the mortality from whooping-cough has undergone a notable reduction in the last three decades, namely from 55.6 per 100,000 of population to 30. Typhoid has lost almost completely its former terrible character. From 1881 to 1885 the annual average of victims to this disease was 22.1 per 100,000 of population, but from 1906 to 1910 only 2.1 per 100,000 of population died of it.

The annual average of deaths from pulmonary tuberculosis, which is the cause of 10 per cent. of all deaths, has dropped from 254.4 to 204.7 per 100,000 of population.

In 1888 there were 161 cases in which syphilis was reported as the cause of death; in 1910 there were 233 cases. How far syphilitic affections formed the basis of other diseases and so acted indirectly to a certain extent as causes of death cannot be determined from the statistics.

In regard to cancer, so far as comparable figures are available (up to 1905), no reduction in the mortality can be discovered, and at least as far as the absolute numbers are concerned, there was an increase, namely, from 6,411 deaths in 1905 to 7,134 in 1910.

Marriages

JOSEPH M. WEAVER, M.D., Allentown, Pa., to Mrs. Frances Pierson Jones of Meadville, Pa., at Baltimore, September 25.

BENJAMIN FRANKLIN MCNEAL, M.D., Swiftown, Miss., to Mrs. Charles B. Tindall, at Hickory, Okla., September 26.

CHARLES O. JOHNSTON, M.D., Claysburg, Pa., to Miss Margaret Della Beegle of Friend's Cove, Pa., September 4.

JAMES M. HANRAHAN, M.D., Elizabeth, N. J., to Mrs. Sarah L. Coleman of Honesdale, Pa., September 25.

JOHN MICHAEL BOHAN, M.D., Galesburg, Ill., to Miss Florence Lynch at Monmouth, Ill., September 25.

ROSCOE W. SMITH, M.D., Walla Walla, Wash., to Miss Alice Marjorie Bacon at St. Paul, Minn., recently.

JACOB C. BOWMAN, M.D., Pineville, W. Va., to Miss Alma Irdeen Yates at Biscoe, N. C., September 18.

CHARLES A. STIMSON, M.D., Eaton Rapids, Mich., to Miss Isabella McBaine of Detroit, September 25.

JOHN W. LYONS, M.D., Jessup, Pa., to Miss Helen G. Meehan of Carbondale, Pa., September 25.

FRED YOHN CRONK, M.D., Guthrie, Okla., to Miss Mildred A. Myers of Baltimore, Md., September 14.

WALTER E. HALFMAN, M.D., to Miss Anna M. Brinkman, both of New York City, September 24.

CARLYLE NEWTON HAINES, M.D., to Miss Bertha Irene Barron, both of Sayre, Pa., September 24.

FREDERICK C. LIDDLE, M.D., to Miss Emily Louise Sykes, both of Dorset, Vt., September 24.

OLLIE WALKER RICE, M.D., to Miss Margaret Propst, both of Alderson, Okla., September 25.

RANDALL EDWARD HOYT, M.D., to Miss Jacqueline Hendricks, both of New York City, recently.

JOHN ARRELL SCUDDER, M.D., to Miss Maysel Bernice Lee, both of Edwardsport, October 1.

ADAM BERT FAIR, M.D., to Miss Alma Boyd, both of Frederick, Okla., September 21.

JOHN RUSSELL, M.D., to Miss Phoebe M. English, both of Des Moines, Ia., September 11.

Deaths

Albert Wood, M.D. Harvard Medical School, Boston, 1862; of Northboro, Mass.; a member of the American Medical Association; president of the board of trustees of the City Hospital, Worcester; vice-president of the board of trustees of Memorial Hospital; treasurer of the Worcester Insane Hospital; councilor of the Massachusetts Medical Society; died at his home in Worcester, September 26, aged 79.

James H. Butler, M.D. University of Maryland, School of Medicine, 1857; formerly demonstrator of Anatomy in his Alma Mater, but for 42 years connected with the Baltimore Custom-House; surgeon of U. S. Volunteers during the Civil War; died suddenly at his residence in Baltimore, September 27, from cerebral hemorrhage, aged 76.

David Robertson, M.D. McGill University, Montreal, P. Q., 1864; of Milton, Ont.; a practitioner of Milton for over thirty years and for several years mayor of that city; elected to the provincial legislature in 1878 and appointed registrar of the county of Halton in 1898; died at the home of his daughter at Nelson, B. C., August 9, aged 71.

John Jay Colton, M.D. University of Pennsylvania, Philadelphia, 1869; a member of the Massachusetts Medical Society; at one time city physician of Lowell and a member of the school board; died at the home of his daughter in Lowell, Mass., September 23, aged 82.

George Ingersol Cutler, M.D. University of Vermont, Burlington, 1864; a member of the New Hampshire Medical Society; at one time a member of the Pension Extension Board of Cheshire County; died recently at his home in West Swanzey, aged 79.

William A. Neal, M.D. Rush Medical College, Chicago, 1857; of Elkhart, Ind.; a member of the Indiana State Medical Society; surgeon of U. S. Volunteers during the Civil War; died in the Clark Hospital, September 25, from kidney disease, aged 77.

Lewis C. Silvernail, M.D. Eclectic Medical College of Pennsylvania, Philadelphia, 1861; of Prattsville, Greene County, N. Y.; for the last twelve or fifteen years a practitioner of Binghamton, N. Y.; died at his home, September 21, aged 73.

Louis M. Griffin, M.D. Tulane University, New Orleans, 1878; a member of the Louisiana State Medical Society; once president of the Franklin Parish Medical Society; died at his home in Oakley, La., September 24, aged 59.

Isaac L. Babcock, M.D. Bennett College of Eclectic Medicine and Surgery, Chicago, 1881; of Rochester, Ind.; formerly of Maxinkuckee, Ind.; a member of the Indiana State Medical Association; died August 19.

Jacob Welty Rugh, M.D. Jefferson Medical College, Philadelphia, 1851; since 1853 a practicing physician of Westmoreland County; died at his home in New Alexandria, Pa., September 28, aged 85.

George W. Maust, M.D. Hahnemann Medical College and Hospital, Philadelphia, 1893; of Lock Haven, Pa.; died in the Hahnemann Hospital, Philadelphia, September 27, from nephritis, aged 47.

Henry Fiske Leonard, M.D. Columbia University, New York City, 1880; of Boston; a member of the Massachusetts Medical Society; died at the Worcester State Hospital, September 25, aged 54.

Arthur Hugo Friedeberg, M.D. Washington University, St. Louis, 1904; of St. Louis; died from strangulation due to a fish bone which lodged in his throat, September 28, aged 48.

Miles E. Barnett, M.D. College of Physicians and Surgeons, Chicago, 1897; of Omro, Wis.; died at the home of his mother in that city, September, from cerebral hemorrhage, aged 47.

Cutler Taylor Ball, M.D. College of Physicians and Surgeons, Keokuk, Ia., 1878; formerly of Terre Haute, Ind.; died at his home in Decatur, Ill., August 26, aged 58.

Lucian Bailey, M.D. Medical College of Ohio, Cincinnati, 1902; of Friendship, Ripley County, O.; died August 26, from heart disease, aged 35.

James R. Caldwell, M.D. Harvey Medical College, Chicago, 1898; of Chicago; died at his home, September 21, from myocarditis, aged 68.

Harry E. Wilcox, M.D., Medical College of Indiana, Indianapolis, 1896; died suddenly at his home in St. Paul, Ind., August 10, aged 41.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

SAMUELS RETURNS TO WICHITA

Detroit Proves Too Hot for this Quack

"Professor" Samuels, who dispenses a weak solution of sugar and salt at $5 an ounce for the cure of all known diseases, has returned to Wichita, Kansas. Some months ago he left the western city and transferred his mail-order business to Detroit. If he did this in the belief that Michigan was an "easy" state and that he would be free from interference by the authorities, he was disappointed. He had barely got settled in his Detroit offices when the public prosecutor, Mr. Hugh Shepard, raided the concern, seized the card index of Samuels' present and prospective victims and, according to the newspapers, carried off a barrel of sugar and a bin of salt. All these things have been referred to in THE JOURNAL[1] before.

Finding Michigan so unsympathetic, Samuels has returned to Kansas and is now "doing business at the old stand." Detroit is to be felicitated. The business men of Wichita do not seem to be very enthusiastic over Samuels' return. The official organ of the Wichita Business Association in discussing fake concerns in that city makes the following reference to Samuels without mentioning the quack's name:

"Only recently the king of quacks and 'fakers,' run out of a big Eastern city, mercilessly handled without gloves by the American Medical Association, has returned to Wichita. Some people received him actually with open arms. Some seem to think that the boost that postal receipts get from this mail-order business atones for any shortcomings he possesses. Righteous indignation surges up rebelliously at the very idea of 'fake' clothing and shoe concerns doing business here, and legislation gets them; but no one seems to care much at the return of this notorious and unconscionable medical quack."

If Wichita has the right kind of public prosecutor, that city can be made to be just as unhealthy for Samuels as Mr. Shepard made Detroit. But the case would need to be handled without gloves. Samuels' business is a fraudulent one and in spite of his wealth, amassed by selling a worthless mixture as a cure for disease, his activities in this line can be curbed.

Like all mail-order quacks, Samuels' chief stock in trade are his testimonials. In his advertising, he makes much of the letters that he claims to have received from his "patients." There is one class of letters that he receives about which nothing is said. We reproduce a few of the letters of this kind. Out of consideration for their writers, we omit the names and addresses of the persons sending them although both are on file in THE JOURNAL office:

TENNESSEE, Feb. 20, 1912.

PROF. H. SAMUELS, Wichita, Kan.

Dear Sir:—I am sending the treatment back that you sent my wife some time ago. She is dead now. The treatment you sent her made her worse and I can prove it. She never used it but six times and she got worse right straight. Now I enclose your treatment back to you and I want my money back. If you don't I am going to pull you for sending something that made my wife worse. There have others told me I could, but I won't bother you if you will send my money back, and if you don't I will see what I can do with you. Awaiting for quick reply, I am,

Yours very truly,
W. F. S.

OHIO, Jan. 21, 1911.

PROFESSOR SAMUELS, Wichita, Kan.

Dear Sir:—I am sorry to tell you my father is dead, and if you have not sent that medicine, please hold same and return our money, as we need it under the present circumstances.

We are greatly in need of money now, and if you will please send our money back, please do so.

If you have a small boy you may put yourself in our condition and think if you were to die and leave a boy and wife to take care of themselves.

You see, my father was a poor working man and put all of his hope in your medicine.

So if you will please send our money back we will be very grateful to you. Yours very truly,
H. S. P.

P. S.—We ask your sympathy in our trouble.

ARKANSAS, May 5, 1911.

PROFESSOR SAMUELS.

Dear Sir:—I will drop you a few lines, as I will send the last treatment of your medicine back. My husband is dead. Just waited too late to cure him, and I am left alone with two little ones to provide for and I can't use your medicine. I will return it, and if you think it right to return the money why do so, for I need it. As that is all, I will close.
E. Y.

IDAHO, May 16, 1911.

PROFESSOR SAMUELS.

Dear Sir:—Received your letter, but Mr. L. was dead at that time. He passed away Saturday, May 6. Kept up with your medicine till the last day; used only half of the one month's treatment. Will you take the medicine back that is left and send me some of the money back, at least $15 of it, as I am a widow with three children, now can use the money badly. Please let me know about it as soon as possible. Have the medicine in a cool dark place. Yours respectfully,
MRS. A. L.

NEBRASKA, Feb. 20, 1912.

PROF. H. SAMUELS,
Wichita, Kan.

Dear Sir:—Something near two months ago I sent you a bank draft for $5 for a month's treatment for my little boy's eye who by accident was hit in the eye with a stick and thus cut in the edge of the pupil of the eye. We rec'd the treatment in due time and used it according to directions, but have received no benefit, as the boy is blind in that eye. I sent you the money in good faith and on your own recommendation and also of Mrs. S. of this place, who is taking your treatment. Now, in view of the fact that we have received no benefit from treatment, do you not feel that it would be right that I should receive my $5 again?

Doc, if I was not a poor man and have four children to look after beside my wife, I would say nothing at all; but in view of the foregoing facts I only ask to be treated by you the same as you would desire to be treated by me were you in my stead. I will close, hoping to hear from you soon. Sincerely yours,
A. F. S.

GRASPING STRAWS

Can these be read without indignation? Do the tragedies they detail call forth no protest against the heartless cruelty of the mail-order quack? Must we wait for that far-off time when the masses of the people shall have developed that healthy scientific skepticism that will make quackery impossible, before doing something to protect the wives and children who are heartlessly swindled by frauds of this kind? Or shall we not ask our legislators to recognize the patent fact that a large proportion of the public needs protection against its own susceptibility and credulity in matters so closely related to its own health?

The Detroit *News* published an interview that one of its reporters had with Samuels at the time this quack was still living in one of the most expensive hotel suites in Detroit. When seen by the reporter Samuels, with his wife and daughter, was about to start for a ride in his

1. June 1, 1912, p. 1693.

motor car. After the interview was over Samuels and his party rode off—but let the reporter tell it:

"They were laughing as they went out in the sunshine and the well-dressed little party looked prosperous—the 'professor' has cleaned up half a million dollars on his compound. But as they slipped into the traffic of the avenue, another picture seemed to arise and sit beside the 'professor'—a gaunt woman holding in her arms a heavily-breathing child. In her hand, a bottle and a medicine dropper. She touches the forehead and starts back. The wasted little body is chilling with the chill of death. The professor opens a letter. She asks for the return of the money she sent him. She does not need the rest of the treatment, the child is dead.

"Then there is a man who coughs slowly and terribly. His face is the color of chalk, his throat is sunken, his hands are so slender the bones seem to start through. A wife bends over and drops a colorless liquid into his eye. With the application goes all of her faith, for is not Professor Samuels the 'Modern Moses'—he says so himself in his advertisements—who will lead the people out of the bondage of sickness and suffering? And mingled with these are many, many others."

Correspondence

Correction in Thymol Dosage for Hookworm Disease

To the Editor:—In my article, "Notes on the Treatment of Ankylostoma Anemia (Uncinariasis, Hookworm Disease) with Thymol" (THE JOURNAL, June 8, p. 1744), it is stated that according to the original method of administering thymol, 12 gm. of the drug were given daily, divided into two equal parts of 6 gm. each, to be taken every two hours. Needless to state, this is an error which slipped into the translation from the Italian and, unfortunately, escaped my notice previous to publication.

The dose of 12 gm.—for adults and strong patients not suffering from complications of the malady—was originally divided into six equal parts of 2 gm. each, administered one dose every two hours. I am anxious that readers should note this correction, because the dose erroneously stated as of 6 gm. taken at one time might give rise to disturbances, especially in the stomach.

CAMILLO BOZZOLO, Turin, Italy.

Physicians Wanted for the Yale Hospital in Changsha, Central China

To the Editor:—The Yale Hospital in Changsha, Central China, needs two men for its staff in the summer of 1913. Men who have recently completed their internship in an American hospital and who wish for a large practical experience in medicine or surgery will find this a splendid opportunity. The last appointee writes that he has had three times as much experience in his first year there as he would have had in the United States.

We have an up-to-date surgical equipment with a great deal of major surgery, and a large medical clinic with a good laboratory for research work. Our old hospital has forty beds, but we are soon to begin the construction of a new plant.

The places are open for either a temporary or a permanent appointment, preferably the latter, and men who have received a Yale degree will be given preference. I shall be very glad to hear from interested men who will state their qualifications and to give them full information about the conditions of appointment.

EDWARD H. HUME, M.D.,
Physician in charge.
156 Fifth Avenue, Room 1228, New York.

Alcohol Among Women.—During the past decade suicide, insanity, imbecility, epilepsy and other nervous diseases have increased about 20 per cent. among women, and are due, according to a standard authority, to the sad fact that our women are indulging too freely in the use of alcoholic drinks.—B. C. Keister, before the Medical Society of Virginia.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

BURTON'S CURE FOR TABES

To the Editor:—Will you please advise me in regard to the standing of C. H. Burton of 92 Broadway, Detroit? He claims to be able to cure locomotor ataxia and is sending out a lot of circular letters telling of his treatment. FRANK J. BARRETT, Hazardville, Conn.

ANSWER.—C. H. Burton, M.D., used to be employed by C. W. Mixer of Hastings, Mich., who conducted a fraudulent mail-order cancer cure concern to which the government denied the use of the mails. Since cancer curing has become unprofitable, Burton is now exploiting a cure for locomotor ataxia. One method by which he obtained the names of prospective patients was described editorially in THE JOURNAL, May 18, p. 1517. A gentleman who wrote to Burton mentioning the fact that he had read THE JOURNAL'S exposé received a long letter in which Burton made the following statement:

> I never was in the laboratory of Dr. Mixer, never had anything to do with him and I scarcely know the man at all. My first thought was to sue THE JOURNAL for slander, but on looking them up I find that they are not worth anything, so a judgment would do me no good.

From this it appears that Burton adds lying to his other accomplishments. Dec. 7, 1909, Burton, in giving a testimonial for Mixer, declared under oath:

> I visit the office of Drs. Mixer daily and give advice in regard to the selection of remedies for patients who write for treatment. I examine all question sheets and either approve of the use of Drs. Mixers' remedies in suitable cases or throw out the sheets because I deem the treatment unsuitable for some.

ASEPSIS IN HYPODERMIC INJECTIONS

To the Editor:—Will you kindly give the technic for an aseptic hypodermic injection? On the hypodermic-tablet tube is the word "aseptic." The tablet is usually emptied into the palm of the hand, picked up by the fingers and put into the syringe; water is drawn into the syringe from a cup, the needle is adjusted, pushed through the skin, and the injection is made. At no time after the tablet (the first tablet) leaves the tube is there anything which approximates asepsis; and still, who ever heard of infection from such procedure? Is anything nicer and neater required? T. C. Y.

ANSWER.—Everything pertaining to the giving of a hypodermic injection should be done aseptically. In hospitals and in many physicians' offices sterile water is kept at hand for hypodermic and other uses; the syringe and the needle are sterilized after each use, ready for the next occasion. In private practice a safe and reasonable procedure consists in boiling some water in the bowl of a spoon, the needle having been placed in the water. Thus needle and water are effectively sterilized. The tablet is carefully dropped from the tablet container into the barrel of the syringe and then the water is poured in. This leaves the needle in the spoon. It is picked up by the screw end and screwed on the barrel without the needle being touched. The site of the injection is rendered aseptic by cleansing with alcohol, or, better still, tincture of iodin.

DURATION OF CONTAGIOUSNESS IN WHOOPING-COUGH

To the Editor:—The question arises frequently as to when the contagiousness of whooping-cough disappears. The texts I have at hand do not supply the information.

1. When may it be considered safe to admit a child to the public school without danger of infection to the other children?
2. Often a child will cough for weeks after it ceases to "whoop" or have spasms of the epiglottis and larynx. Is it safe to allow these children to attend school while there is any cough?

W. W. CASSIDY, M.D., Durand, Wis.

ANSWER.—1. The question as to when whooping-cough ceases to be contagious is still unsettled. It is becoming more probable, however, that the time is nearer the beginning of the disease than was formerly thought. While it seems probable that there is little if any danger of contagion after the first few weeks, it is safer to place the point of cessation of danger of contagion at the end of the paroxysmal stage. The Chicago Health Department requires children to remain away from school until that time, and makes the seventh or eighth week the earliest time at which it is considered safe for a child to return to school.

2. The cough that is even spasmodic at times, and frequently lasts or recurs for months after the active spasmodic stage, is regarded as being wholly free from danger to others.

GRATUITOUS INFORMATION TO INSURANCE COMPANIES

To the Editor:—1. In your opinion, has a physician any right to answer the questions asked on the following blank without the consent of the individual concerned?

2. Should a life-insurance company expect such service without paying for it? Is not the request a courteous imposition?

J. E. TUCKERMAN, Cleveland.

To Dr. .....

My Dear Doctor: In applying for insurance, ... aged ...., of ....., occupation ..... states that you treated ..... for ..... on or about ..... Will you have the courtesy to answer the questions hereto subjoined and return same in enclosed stamped envelope?

Respectfully yours,

.....

Medical Director.

1. Was ailment same as mentioned by applicant? If not, state correct diagnosis.
2. State duration, severity and sequel on vitality.
3. Is he now in good health?
4. Did you ever prescribe for or attend him professionally at any other time? If so, when and for what?
5. Did he, to your knowledge, have the advice or attendance of any other physician? If so, who, when and for what?

ANSWER.—1. The civil law concerning "privileged communications" is not the same in all the states. Consequently, the legality of the physician's act in answering varies, depending on the state from which the reply is made. In practically every instance, however, an applicant for life insurance waives whatever rights he might have under the law and grants the company the privilege of seeking and obtaining information concerning his past and present physical condition. Under these conditions, the physician has a "right" to answer the questions.

2. The company asks for information and an opinion which have a value, or the inquiry would not be made. The physician must decide whether he will give an opinion gratis or ask a reasonable remuneration for it. The regular medical attendant of the applicant may be prompted to "throw in" this report as a gratuity to a patient; or because of business or social connections, he may feel that he already has received a return in similar courtesies accorded him. If he requires a fee, his response should be that he invariably expects a fee for searching his case records for the information and framing the opinion requested in the company's form letter. This is the practice of a number of physicians.

THERAPEUTIC VALUE OF AGMEL

To the Editor:—Please give information regarding the use of Agmel and the Mexican plant from which it is made, in the treatment of chronic nephritis.

J. L. ALLEN, M.D., Calgary, Alta.

ANSWER.—Agmel is said to be a concentrated syrup made from the juice of the maguey, or century plant, *Agave americana*. This plant is a source of a cider-like, fermented liquor used in Mexico under the name of "pulque." Chemical examination (reported to the Council on Pharmacy and Chemistry) of the concentrated syrup showed the specimen to be a kind of molasses which is apparently rendered more or less stable by the small quantity of formic acid which it contains. No alkaloids were found present, nor more than a trace of protein matter, and the conclusion drawn is that the trace of formic acid probably represents the sole medicinal constituent of the preparation. Experiments on frogs indicated that the slight effects observed can be explained by a mere injection of such concentrated sugar solutions.

From the facts as given above it would seem that the therapeutic value of the preparation is practically *nil*. There are a sufficient number of excellent, official diuretics for use in nephritis when diuresis is indicated, without it being necessary to resort to an unofficial preparation under a proprietary name, the composition of which gives no promise that it will be of value in this disease.

THE VERONAL HABIT

To the Editor:—Will you kindly inform me if there have been reported many cases of the veronal habit, also the symptoms and results of the habit and the prognosis and treatment? Are any symptoms akin to morphinism—that is, as far as being cheerful one day and moody and depressed the next—liable to appear in a person addicted to taking veronal frequently? Please give reference to any recent literature on veronal addiction. C. A. L.

ANSWER.—Like other hypnotics, veronal may lead to the formation of a habit. There is practically no literature on the subject and we can give no description of the symptoms.

COLOR IN GERHARDT'S DIACETIC ACID TEST

To the Editor:—Is there not a slight mistake in the wording of "Gerhardt's diacetic acid test" in the article on "Acetonuria," by Dr. Sidney A. Chalfant (THE JOURNAL, Sept. 14, 1912, p. 852): "Add 10 drops of tincture ferric chlorid and if a yellowish-brown color still appears, diacetic acid is positive; if a yellowish-brown color, diacetic is negative"? WEEKLY READER.

ANSWER.—The passage as quoted is obviously incorrect, an error having occurred in putting the article into type. As indicated by the context, the first "yellowish-brown" should have been "reddish-brown." The paragraph should have read:

Take 1½ inches of urine plus 10 drops of tincture ferric chlorid; shake and if a reddish-brown color is obtained, take another specimen of urine and boil; then again add 10 drops of tincture ferric chlorid and if a reddish-brown color still appears, diacetic acid is positive; if a yellowish-brown color, diacetic is negative.

The passage as it stands, however, will lead to misapprehension, as it would naturally be supposed that the persistence of the color was characteristic of diacetic acid. This is not correct. Diacetic acid is decomposed on boiling. If this decomposition were complete the addition of ferric chlorid should make no change in the boiled specimen except for the yellowish tint caused by the color of the reagent. The decomposition on boiling is, however, not complete even at the end of half an hour; hence the reddish-brown color usually persists but is much fainter. If the greater part of the red color is discharged, the substance which gave the reddish-brown color in the unboiled urine was diacetic acid, but if it remains as strong after boiling as before, the coloration must be due to some other substance. In making this test the mixture should be filtered after the addition of the ferric chlorid and if no color appears a few drops more of the ferric chlorid should be added. The reason for this is that iron is precipitated by the phosphates in the urine and may be entirely removed from solution. The turbid mixture of urine with precipitated phosphates will not allow the color due to diacetic acid to be clearly seen until after filtration.

LITERATURE ON CHRONIC POLYARTHRITIS WITH TUBERCULOSIS

To the Editor:—Please give me references to late literature on the subject of chronic polyarthritis (popularly known as chronic joint rheumatism) with tuberculosis as a possible cause. Some articles are said to have appeared in foreign journals lately, but I have been unable to find the references. T. D. Q.

ANSWER.—Following are some recent articles on the subject:

Weeks, S. H.: Tuberculous Arthritis of the Hip-Joint, *South. Med. Jour.*, January, 1909; abstr. in THE JOURNAL, Oct. 31, 1908, p. 1537.

Poncet, A.: Acute Tuberculous Rheumatism, *Med. Press and Circular*, July 28, 1909.

Melchior, E.: Tuberculous Articular Rheumatism, *Centralbl. f. d. Grenzgeb. d. Med. u. Chir.*, Dec. 30, 1909; abstr. in THE JOURNAL, Feb. 12, 1910, p. 573.

Orr, H. W.: The Non-Operative Treatment of Tuberculous Arthritis, *Med. Herald*, August, 1910.

Melchior, E.: Tuberculous Articular Rheumatism, *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, xxii, No. 3; abstr. in THE JOURNAL, Feb. 18, 1911, p. 547.

Tommasi, L.: Tuberculous Rheumatism, *Rev. de méd.*, April, 1911, No. 4; abstr. in THE JOURNAL, July 1, 1911, p. 51.

Veras, S.: Tuberculous Rheumatism, *Bull. Soc. de pédiat. de Paris*, June, xiii, No. 6; abstr. in THE JOURNAL, Oct. 7, 1911, p. 1245; Three Cases of Tuberculous Rheumatism, *Ann. de méd. et chir. inf.*, Sept. 15, 1911.

Lyle, H. H. M.: Tuberculous Rheumatism, *Ann. Surg.*, May, 1912.

LITERATURE ON SERODIAGNOSIS IN PREGNANCY

To the Editor:—Some weeks ago I read an extract regarding some work done on the complement fixation test in the diagnosis of pregnancy. I do not remember where I saw the reference and in looking over my files I am unable to find it. Please give references to articles which have been written on this subject.

B. F. STOUT, M.D., San Antonio, Tex.

ANSWER.—The following may be referred to:

Fieux, G., and Mauriac, P.: Serodiagnosis of Pregnancy, *Ann. de gynéc. et d'obst.*, February, 1910, No. 2; abstr. in THE JOURNAL, April 2, 1910, p. 1174.

Rosenthal, E.: Serodiagnosis of Pregnancy, *Ztschr. f. klin. Med.*, Nos. 5-6, 1911; abstr. in THE JOURNAL, June 17, 1911, p. 1865.

Fieux, G., and Mauriac, P.: Serum of Non-Syphilitic Pregnant Women Gives Positive Response to Simplified Wassermann Test, *Jour. de méd. de Bordeaux*, March 24, 1912.

Fieux, G., and Mauriac, P.: Serodiagnosis of Pregnancy, *Ann. de gynéc. et d'obst.*, May, 1912, No. 5; abstr. in THE JOURNAL, July 6, 1912, p. 71.

Abderhalden, E.: Serodiagnosis of Pregnancy, *Münch. med. Wchnschr.*, June 11, 1912; abstr. in THE JOURNAL, July 20, 1912, p. 235.

Editorial in THE JOURNAL, Sept. 14, 1912, p. 881.

Society Proceedings

COMING MEETINGS

American Association of Railway Surgeons, Chicago, Oct. 16-18.
Clinical Cong. of Surgeons of North America, New York, Nov. 11-16.
Kentucky State Medical Association, Louisville, Oct. 29-31.
Mississippi Valley Medical Association, Chicago, Oct. 22-24.
Southern Medical Association, Jacksonville, Fla., Nov. 12-14.
Virginia Medical Society, Norfolk, Oct. 22-25.

INTERNATIONAL CONSERVATION CONGRESS

Fourth Annual Congress, held in Indianapolis, Oct. 1-4, 1912

The President, HON. J. B. WHITE of Kansas City, in the Chair

While the attendance was not equal to that of the two preceding congresses, the interest was unabated, the enthusiasm for better public health legislation being marked. A large and interesting hygienic exhibit was arranged in the corridors and rotunda of the state-house, a large portion of the material exhibited being supplied by the Indiana State Board of Health. In addition to the exhibit, illustrated lectures on public health were given three times a day, the stereopticon and moving-picture machine being used.

The first session was devoted to the usual addresses of welcome and responses, and addresses by President White and by Hon. H. L. Stimson, Secretary of War, representing the President of the United States. At the second session Prof. George E. Condra, president of the National Association of State Conservation Commissioners, reported on "What the States are Doing." Dr. W. A. Evans of Chicago spoke on "Human Life, Our Greatest Resource," and various committees reported progress during the year. In the evening, a public meeting was held at Tomlinson Hall at which Dr. Harvey W. Wiley spoke on the "Conservation of Man."

Human Life as a National Asset

At the Wednesday morning session, Mr. E. E. Rittenhouse of New York City, Conservation Commissioner for the Equitable Life Assurance Society of the United States, read a paper on this subject, which was noteworthy as summing up the entire question of conservation of life on a basis of hard, uncontrovertible facts. The paper was written by a business man, and not by a physician or sanitarian, which makes it all the more noteworthy.

Mr. Rittenhouse said: The life-saving movement is still in its infancy. It has been directed so far almost wholly against contagious diseases common to infancy and early adult life, while the degenerated diseases of middle life and old age, to which comparatively little attention has been paid, are steadily increasing. The average length of human life has been increased by increasing the proportion of people living in the younger age periods, while the average duration of life of those who pass into middle life and old age has been constantly shortened. The principal items of life waste are due to the hazards, habits and conditions of life which civilization has introduced.

Our fire losses amount to about $250,000,000, to prevent which our cities are spending $1.65 per capita. Our annual economic loss fro mpreventable diseases is conservatively estimated at $1,500,000,000, to prevent which our cities are spending 33 cents per capita. A million and a half people in the United States are constantly suffering from preventable diseases. During the next ten years, over 6,000,000 lives will be needlessly destroyed, if present conditions continue. The city and state health officer knows that with an appropriation of $1.50 per capita, the health, happiness and longevity of the community can be greatly increased, but as the taxpayer will give him only 25 cents per capita, he is compelled to run a 25 cent health department. Even in Pennsylvania the appropriation is only about 48 cents per capita. Arkansas spends nothing at all for this purpose; New York State spends about 1.7 cents; Massachusetts, 4.2 cents; Florida, 10 cents; Indiana, 1.8 cents; Kansas, 2.7 cents, and Virginia, 1.9 cents. In cities the same condition exists. Providence, R. I., spends 11 cents per capita for health and $1.99 per capita for fire protection; Portland, Ore., spends 13 cents per capita for health and $1.91 for fire protection; Minneapolis spends 14 cents per capita for health and $1.67 for fire protection.

To remedy these conditions, business institutions, civic, social and religious organizations should join in a life-conservation campaign. The individual should be educated to adopt the healthful habits of life. Communities should be urged to establish public health organizations; the organization of local health leagues and the encouragement of rigid supervision of contagious diseases should be advocated. Every effort should be made to encourage states and municipalities to appropriate sufficient funds to finance adequate health departments.

The Public Health Movement

PROF. IRVING FISHER of Yale gave a history of the present movement for better health conditions, the organization of the Committee of One Hundred, the efforts made to secure the establishment of a national Department of Health, and the present situation. He also discussed the conditions in public health in Sweden and other European countries, and emphasized the importance of a national Department of Health, of proper vital statistics and of careful study of eugenics to provide a better race for advanced generations.

Authority in Health Control

DR. L. E. COFER of the United States Public Health Service reviewed the public health loss of the United States, and of the different states. He said that he was at a loss to suggest what additional health legislation is necessary or desirable. He is unable to see the necessity for any different plan of organization than that now in existence, as long as the people in whose behalf the organization is maintained are satisfied.

The remainder of the morning was devoted to a discussion of farm lands and agriculture.

Conservation and Its Relation to Hygiene

At the afternoon session, DR. OSCAR DOWLING of New Orleans, president of the Louisiana State Board of Health, spoke on this subject.

Duty of the Employer Toward Conservation

MR. E. A. RUMELY, La Porte, Ind., stated that we must care for the increasing population, not by increasing exploitation or natural stores, but by providing abundant work for skilled labor. Agriculture has been a process of mining. The farm must now furnish a field for the profitable employment of skilled labor, for the use of capital and the demonstration of the principles of scientific management, becoming thereby a workshop instead of a mine.

Duty of the Teacher Toward Conservation

PROF. E. T. FAIRCHILD of Topeka, Kan., president of the National Educational Association, emphasized the need of better teachers and better equipment for the public schools, especially in rural districts.

Duty of the State

DR. J. N. HURTY of Indianapolis, secretary of the Indiana State Board of Health and ex-president of the American Public Health Association, advocated the restriction of the use of drugs, poisons and improper foods, the prevention of overfatigue, the reduction in venereal diseases and the use of alcohol in order to reduce crime, pauperism and insanity.

Section meetings on foods and on accident prevention were held later in the afternoon.

Accident Prevention

MR. MELVILLE W. MIX of Mishawaka, Ind., president of the Dodge Manufacturing Company and vice-president of the National Association of Manufacturers, one of the founders and a director of the National Society for the Promotion of Efficiency, said: Almost every establishment is to-day giving more thought to the safety of its employees, with the result that employers themselves are necessarily compelled to give more thought to the safety of themselves and others. The popular disregard for personal safety is the most important factor in the present situation. There must be an established

public conviction, an active, subconscious state of mind that automatically thinks of safety first, before industrial accidents will be reduced. It may be a generation or two before this is brought about. It can be accomplished only by constant drill and discipline. We are lacking in proper statistics regarding these questions, and have to rely on Germany for much of our information.

Cold Storage

DR. HARVEY W. WILEY, speaking before the food section, emphasized the improved condition of cold-storage business.

MR. FRANK A. HORNE, chairman of the Committee on Legislation of the American Association of Refrigeration, said that the cold-storage warehouse was performing a useful public function.

In the general discussion which followed, Dr. Wiley said that attacks on the cold-storage business five years ago were justified by conditions, which have since greatly improved.

History and Importance of the Conservation Movement

In the evening, MR. HENRY WALLACE, editor of *Wallace's Farmer*, Des Moines, Iowa, reviewed the history of the conservation movement, and said that man is after all the biggest thing on the planet. The farmer is more important than the farm. The American farmer has farmed some of the richest soils in the world for a few generations, and has wasted fertility so recklessly that he is now crying out for commercial fertilizer, while the Chinese have farmed the same soil for at least forty centuries, and have maintained the soil fertility without the use of such fertilizers. The only way to restore wasted fertility of the soil, and the waste of the forests and mineral resources, is by increasing to the utmost limit human efficiency, physically, mentally and morally.

Pensions for Mothers

JUDGE BEN B. LINDSEY of the Juvenile Court of Denver appealed for state pensions or compensation for needy mothers, reviewing the child welfare movement and emphasizing the duty of the state to the child.

The audience at the evening meeting was large and attentive.

The program Thursday morning included an address on "Lumber Conservation" by Major E. G. Grigg, of Tacoma, president of the National Lumber Manufacturers' Association, and a symposium on the prevention of accidents, which included a paper on "Saving Miners' Lives," by Dr. John A. Holmes of Washington, director of the National Bureau of Mines; Mr. Thomas H. Johnson of Pittsburgh, Pa., consulting engineer of the Pennsylvania Railroad, on the "Prevention of Railroad Accidents," and Mr. Reginald P. Bolton of New York, on the "Prevention of Elevator Accidents."

In the afternoon the congress met in the Coliseum building at the State Fair Grounds, where an address was given by Hon. Woodrow Wilson, governor of New Jersey.

In the evening a women's meeting was held, with Mrs. Philip M. Moore of St. Louis, ex-president of the General Federation of Women's Clubs, in the chair. Addresses were given by Mrs. Matthew T. Scott of Washington, president-general of the Daughters of the American Revolution; Miss Julia C. Lathrop, chief of the Children's Bureau, Department of Commerce and Labor; Mrs. John R. Walker of Kansas City, honorary vice-president-general of the Daughters of the American Revolution, and Mrs. Marion A. Crocker of Fitchburg, Mass., chairman of the Department of Conservation of the General Federation of Women's Clubs.

The fourth and last day's session included addresses on "Conservation of Human Life," by Mr. A. B. Farquhar of York, Pa.; on the "Problem of Tuberculosis," by Dr. Livingston Farrand, executive secretary of the National Association for the Study and Prevention of Tuberculosis; "Water as a Natural Resource," by Dr. W. C. Mendenhall of the United States Geological Survey; "Conservation and Civics," by Mr. Ralph M. Easley, National Civic Federation; "Disposal of Sewage," by Dr. Burton J. Ashley, Morgan Park, Ill.; "The Story of the Soil," by Mr. H. H. Gross of Chicago, president of the National Soil Fertility League, and "The Story of the Air," by Prof. Willis L. Moore, Chief of the United States Weather Bureau

Resolutions on Health Conservation

At the afternoon session the report of the Committee on Resolutions was adopted. The following resolutions refer to vital resources and public health:

Recognizing the natural resources of the country as the prime bases of property and opportunity, we reaffirm the declaration of the preceding congress, that the rights of the people in these resources are natural, inherent and inalienable; and we insist that these resources shall be developed, used and conserved in ways consistent both with current welfare and with the perpetuity of our people.

We put chief emphasis on vital resources and the health of all the people; since health and brains are the first and most important factors for efficient life, we urge the adoption of all rational and scientific methods which will lead to their building-up.

To be well born is the primal requirement, and the first step to make sure that children shall be well born is to stop the multiplication of those bearing hereditary defects of body and mind. We believe that science is capable of solving the problem satisfactorily and that improvement is possible under existing conditions. We earnestly urge its consideration by the public.

We believe that every state should have wisely ordered health laws, with well-paid health officers with power to enforce them, and also that a national Department of Health should be created comporting with the dignity and importance of the cause. This department should work effectively for the promotion of the physical and hence the moral and intellectual health of the people.

The accurate registration of births and deaths, which has been called the "bookkeeping of humanity," is a fundamental necessity for a study and knowledge of disease, and for all public health work; therefore, we affirm our belief in the importance of vital statistics registration, and recommend that all states now without proper vital statistics adopt as early as possible the model bill for the registration of vital statistics endorsed by the United States Bureau of the Census and by many prominent professional and scientific bodies.

We urge the strengthening of laws safeguarding the health and the lives of workers in industrial establishments; and we commend to the employers of labor all practicable safety devices and proved preventive measures against illness and injury and physical inefficiency; and we urge on the other states the investigation of accidents by elevators and the enactment of laws similar to those on the statute-books of Pennsylvania and Rhode Island.

We commend the activity of all individuals and organizations and governmental agencies to put an end to such work by children and women as impairs the health of the race. Childhood is our greatest resource and its right to protection in growing to a normal maturity is inalienable. We deplore the ignorant use of medicines; and we call on all human and educational agencies to teach the waste and danger of any drug-habit.

We earnestly advocate the employment by communities and manufacturing concerns of such methods of sewage disposal as will render their waste products harmless to health and utilize them in the restoration of soil fertility; and we urge the enactment by states of laws prohibiting stream pollution, and by the federal government of such legislation as will prevent the pollution of interstate and coastal waters.

Uniform state legislation regulating the refrigeration of perishable foodstuffs is advisable; therefore this congress recommends that its food committee be requested to study the questions involved in the production, collection, sanitary preparation, transportation, preservation and marketing of perishable foods and to report its findings to the succeeding congress as a basis for uniform legislation.

Officers Elected

The following officers were elected for the coming year: president, Mr. Charles L. Pack, Cleveland; vice-president, Mrs. Philip N. Moore, St. Louis; secretary, Mr. Thomas R. Shipp, Indianapolis.

INTERNATIONAL CONGRESS ON HYGIENE AND DEMOGRAPHY

Fifteenth Meeting, held at Washington, D. C., Sept. 23-28, 1912

(Continued from page 1316)

Protection of Passengers

DR. H. M. BRACKEN, Minneapolis, Minn.: It is the duty of railways to protect their passengers from disease. The traveling public spreads disease through ignorance, indifference and selfishness. Some travel on railway trains, knowing that they are suffering from a contagious or infectious disease. Others travel, knowing that they are carriers of disease germs, which do not affect them, but which are communicable from them to others. To this extent, responsibility for jeopardizing of passengers on railroads rests with the public.

Rural Hygiene

DR. JOHN N. HURTY, Indianapolis: Rural hygiene is really not different from urban hygiene; the question is: How much and how shall the general principles of the science be applied? The first step in rural hygiene is to see to it that rural

dwellers are well born. The weak, the degenerate and those exhibiting transmissible physical, mental and moral defects, should not propagate. Accurate birth, death and disease records are necessary for an understanding of the situation, and must be reckoned with. The rural dwellers should be made to appreciate fully the fact that disease prevention is possible and being sick is the result of wrong living. Sanitary farm houses are rare, very many being very unsanitary. Too many are flat on the ground, lacking ventilation beneath; they are damp, mold is frequently found in closets and in corners; bed-rooms are small, lighted and ventilated with one small window; water-supply is frequently polluted; sewage disposal is by shallow pits open to flies and animals and so situated as to pollute the well. Fly culture conditions are usually in great perfection on farms. Barns and stables and their yards are generally too near the farm houses, abound in accumulations of manure and the ground churned to a filthy pulp by animals. The proper preparation of food is not understood. Bread is very frequently badly made, over-fermented and not sufficiently baked; the yeast cells not being killed sour stomach and dyspepsia are provoked. For good health, too much smoked, pickled and salted pork is used. The frying-pan is overworked. Pickles and vinegar are abused. Oral hygiene is almost unknown in rural life; the teeth of the women and children are sadly neglected. Bath rooms are few and underbathing results. Much harm to rural health attends self-doctoring; the farmer must be raised out of the "patent-medicine" stage of ignorance.

The New Art of Ventilation

PROF. C. E. A. WINSLOW, New York City: Overheating and excessive moisture are the prime conditions to be guarded against in ventilation. Since human beings and various processes of combustion produce heat and moisture in all occupied buildings, it is essential that there should be always at hand some source of coolness to counteract them. This can best be provided for by constantly supplying air at a temperature somewhat below that to be maintained in the room. Good ventilation requires the lowering of the temperature of the room by cool air as soon as it reaches 68 or 70 F. This implies the use of direct heating in cold weather, to warm the room when it gets too cold, as the air-supply cools it when it grows too hot. An air-supply of 2,000 cubic feet per person per hour at 60 F. would be required to remove the excess heat produced by the average adult.

If the introduced air is at a lower temperature than the room it should obviously be introduced near the floor, while the heated air is removed from above. The ordinary type of downward ventilation used in schools necessarily fails as soon as the room temperature rises to that of the incoming air. The incoming air should generally be tempered in cold weather so that as it enters it may not produce discomfort on the part of the occupants. Window ventilation may be satisfactory in hospitals. It is wholly impracticable in factories and auditoria. It is very doubtful whether it will ever be generally adopted in schools. Finally, it is essential that the cool tempered air should be distributed from properly designed ducts through multiple openings sufficiently numerous to give even distribution without the discomfort caused by objectionable drafts.

Sanitary Questions Concerning the Immigrant in His Home Country and in the United States

DR. JOHN CONSTAS, Washington, D. C.: As a result of close contact with the foreign elements in this country for several years, I offer the following suggestions on the question of immigration to the United States of America, viz.: 1. Compulsory physical examination of prospective immigrants before leaving their village for the shipboard. No immigrants to be sold transportation except on presentation of a certificate showing the results of such an examination. 2. Distribution on board ship of literature on sanitation in all languages. 3. Immigrants suspected of having been in contact with typhoid fever and cerebrospinal meningitis patients should be treated as those having been in contact with other dangerous contagious diseases. 4. Distribution of literature in all languages on landing, emphasizing sanitary laws and the penalties inflicted for their breaking. 5. Boards of health should placard places where immigrants live with same literature in their native language. 6. Furnishing of screens at cost to those unable to purchase them. 7. Early and vigorous enforcement of sanitary laws. 8. Physicians should be invested with authority to enforce the sanitary laws. 9. Physicians treating immigrants should instruct them in all matters pertaining to sanitary and personal hygiene. 10. Frequent illustrated lectures on sanitary matters in immigrant quarters.

The Fight Against Malaria

DR. RUGE, R.N., Kiel, Germany: We must resort to all possible methods. According to the local conditions one or another method of combating the disease must be emphasized.

1. *Fight Against Mosquitoes.*—The direct extermination of the mosquitoes and their larvæ, also the protection from mosquito-bites.

2. *Quinin Prophylaxis.*—Prophylaxis which may have good results in one region may not do at all in another. None of the known methods of quinin prophylaxis, even if used in regular treatment, protects absolutely. As soon as fever develops, prophylaxis must cease and treatment begin.

3. *Sanitation.*—By drainage, reclaiming of marshes and ponds, regulation of river courses and cutting underbrush.

Mortality and Causes of Death by Occupations

DR. JACQUES BERTILLON, Paris, France: I have tabulated various occupations and professions with respect to degrees of frequency of various causes of deaths in each. I made 725 subgroups of professions and occupations and classified them into three major groups, under groups of professions in which tuberculosis is generally frequent; in which tuberculosis is rare, but liver diseases are frequent or moderately so, and in which liver and kidney diseases are rare, or professions exercising in the open-air without straining to rest. I found that with farmers, agriculturists, horticulturists, foresters, all causes of death are rare; that they are the most healthfully occupied class of workers. The least healthy persons are those engaged as wine merchants, brewers and handlers of liquor. All causes of death, except accidents, are extraordinarily frequent for this group. In the professions, exposed to the changes of weather and compelling the operatives to rest, all causes of death are frequent, but liver diseases are less frequent than one could imagine since alcoholism is very common in these professions. Diseases of the respiratory system are rare in all professions generally performed in confined places, but clerks in railroad offices are the only ones with whom tuberculosis is rare. Priests and professors separate themselves from the other liberal professions by the rarity of liver and kidney diseases.

Cost of High Living in Its Relation to Public Health

PROF. MAX RUBNER, Berlin: One of the greatest, if not the greatest, problems now confronting mankind is that of providing the race with proper nourishment. It is of such importance that every city should have a department in its government clothed with plenary powers of caring for this branch of the people's welfare. Changed conditions in the last half century have brought the question of feeding the human race to a critical point. The growth of the cities and the industrial workers as a class has complicated the problem to a point where it is becoming necessary for the city governments to maintain a jealous watch that all of their citizens receive the proper nourishment. School children should be watched particularly and, in the case of those children who fail to receive proper or sufficient nourishment at home, the deficiency should be made up. This is being done in some of the lower schools in Germany. There has been a distinct step backward in the organism of the working man. This is due to two causes, first, insufficient nourishment, and second, the fact that the new era of machinery has specialized and confined his physical exertions so that he gets little or no natural, general exercise. In order to have on his table the same articles which appear in the menus of the more wealthy, he has reduced the quantity of his nourishment to an insufficient amount. Then, too, cooking is a lost art as far as most

women in this modern age are concerned. They marry and take on themselves the responsibilities of marriage without having mastered the first principles of food preparation, and without even having an idea as to which articles of food are desirable. This condition should not be so, and is a big factor in the high cost of living.

Interstate Commerce Law in Relation to Public Health

HON. JUDSON C. CLEMENTS, Washington, D. C.: Public health officers should institute an investigation with a view to ascertaining the extent of mortality resulting from the pollution of highways from passing trains. It is only reasonable to suppose that much disease and consequent mortality results from the pollution of the highways both by refuse from passing trains and from water-carriers. If it can be proved that disease does result from the pollution of the highways, Congress will legislate to remedy the condition.

Cerebrospinal Meningitis

DR. SIMON FLEXNER, New York: I have examined nearly 1,300 cases of this disease in which the serum was used. These cases were representative, coming from all parts of the country. Of 1,249 patients, 849 recovered and 400 died, fixing the death-rate at 30 per cent. The normal death-rate in this disease before the discovery and the use of the serum was about 70 per cent. There has been an absolute reversal since the advent of the serum, 30 per cent. now die where before only 30 per cent. recovered. In the Louisiana epidemic, serum was administered to 176 patients, of whom 123 recovered. To seventy-four patients the serum was not administered. Of these, sixty-three died. The death-rate where the serum was not used was about 85 per cent. The action of the serum was alike on both whites and blacks in the Louisiana epidemic, but where the serum is not used the blacks stand far less chance of recovery.

Yellow Fever

DR. EDUARDO LICEAGA, Mexico City: The physicians in the Mexican republic make sure that all of the mosquitoes are exterminated. Into the room which they intend to purge they carry large mosquitoes in tubes. If after they are fumigated, the insects are dead, they feel sure that all the pests are exterminated.

The Development of Vital Statistics in the United States Since 1900; Measures Needed for the Immediate Future

DR. CRESSY L. WILBUR, Washington, D. C.: The registration of births and deaths depends chiefly on the enactment and thorough enforcement of adequate laws for this purpose by the states. The difficulty of securing uniform and effective legislation by independent state action is shown by the development of the registration area for deaths prior to 1900. The rapid growth of the registration area since 1902 is due to the cooperation of the Census Bureau, since its establishment on a permanent basis, with the state authorities, the American Public Health Association, the American Medical Association and other organizations, a cooperation furthered by resolution of Congress on the subject.

The extension of the registration area during the past decade has been largely due to the adoption of the "model law" for the registration of births and deaths. There is necessity for properly compensated local registrars, each with a definitely defined district, burial permits, monthly returns of the original certificates to the state registrar, and adequate central supervision. All "county systems" seem to fail. There are essential differences between American and European methods of registration. American methods are best adapted to conditions in the United States and will ultimately yield fully satisfactory results. There are some difficulties in registration and possible revision of the model law, but with the aid of the American Medical Association and the American Bar Association, these will be overcome in certain minor respects. The failure of birth registration in the United States is due to weakness in the enforcement of law. There is great need of building up public sentiment that will demand the uniform and effective enforcement of registration laws throughout the United States

The Municipal Control of Plague

SURGEON-GENERAL RUPERT BLUE, U. S. P. H. S., Washington, D. C.: To eradicate plague from a city, it is necessary to have an organization for that purpose, and to have laws covering the necessary sanitation. The continued enforcement of rat-proofing laws in a city that has once been infected is emphasized as the best insurance against a recurrence of the disease. Plague is to be eliminated from the history of mankind by the application of similar principles wherever infection exists. By international regulations all vessels should be fumigated periodically to kill rats; infected ports should have a medical surveillance of outgoing traffic. Notification should include both epidemic and epizootic foci of the disease.

The Intercarriage of Typhoid Infection Between Urban and Rural Communities

DR. ALLEN W. FREEMAN, Richmond, Va.: The principal factors transmitting typhoid infection between urban districts and from rural to urban districts are: 1. By persons: carriers (temporary or permanent), persons in the incubative stages of the disease and persons actually sick with typhoid fever. 2. By foods and drinks, including water, dairy products, garden truck, fruits, shellfish and possibly other foods.

The principal factors transferring typhoid infection from urban to rural communities or between rural communities are: 1. Persons infected in the cities or towns and incoming carriers. 2. Food of various kinds. 3. Night soil and manure carried out of cities for fertilizing purposes. 4. Stream pollution. 5. Railway trains.

Various means of controlling some of these factors are now being used and others are necessary. A careful, comprehensive, detailed campaign against the disease will inevitably result in a large reduction in the amount of infection thus transmitted, leaving any community free from the danger of exogenous infection and in a position to control the disease by an attack on the enemy generated within the city wall.

Thymol in Uncinariasis

DR. C. WARDELL STILES and DR. GEORGE F. LEONARD, Washington, D. C.: Comparing sixty-one hospital treated cases with twenty-two home cured cases, the conclusion is reached that many cases of hookworm infection are cured by less than one maximal dose for the age group in question. In view of the foregoing fact and because many of the patients are ignorant and illiterate, and cannot be relied on to carry out instructions, the authors do not favor the administration of larger doses of thymol for home treatment than the present standard dose. The authors do not believe that treatment alone is a practical method of hookworm eradication.

(To be continued)

AMERICAN ROENTGEN RAY SOCIETY

Thirteenth Annual Meeting, held at Niagara Falls, N. Y., Sept. 11-14, 1912

(Continued from page 1210)

The Roentgen-Ray Examination of Goiter

DRS. ANDRÉ CROTTI and CHARLES F. BOWEN, Columbus, Ohio: Percussion is not to be relied on to detect the so-called intrathoracic goiter. The Roentgen ray furnishes an absolute means of diagnosticating this condition. Not only that, but it has been shown recently that in many cases of goiter, especially the exophthalmic variety, the thymus is enlarged. Such enlargement can be detected only by the Roentgen ray. Therefore the Roentgen examination should form an important part of the examination in goiter work. Many patients suffering from exophthalmic goiter who are operated on are not relieved of their symptoms. It has been shown that this is due to either an intrathoracic enlargement of the thyroid or a large thymus, which compresses the trachea or deflects it in its course, so that it is twisted. The diagnosis of thymus hyperplasia is possible in the majority of cases by means of the Roentgen ray. We have had five cases of this kind, in some of which the diagnosis of enlarged thymus was not made until

it was too late. The Roentgen picture of this condition is so characteristic that it cannot be mistaken, and therefore the value of such an examination cannot be emphasized sufficiently. When the condition is present it is well to postpone operation for a while and subject the patient to Roentgen irradiation in the region of the thymus, until the size of the gland has diminished markedly, when the thyroidectomy can be done.

The thymus has also been removed successfully in these cases, and that operation is to be considered. The results reported are good. Our studies of these cases have shown that the thymus becomes markedly congested, and it is then that the patient suddenly chokes, cries out, and is dead in a few minutes. In one of our cases we were able to make a skiagram of the thymus in the state of congestion just before death. It was this case that pointed the way to the work we have done on the thymus gland in goiter. The patients are usually asleep when the spasm comes. They awaken suddenly, complain of a choking sensation in the chest, and death soon follows. The operation of thymectomy is not a difficult one, as such operations are viewed at the present time. The results which accrue from its performance justify the operation.

DISCUSSION

DR. SIDNEY LANGE, Cincinnati: In Germany the association between goiter and thymus has been known to exist for a long time, but the observation seems to have attracted little attention. These two glands are complementary—when the thyroid develops in size, the thymus recedes, and when one is removed the other enlarges. The secretions of the two glands seem to have a common physiologic action. There must be a close connection between the two glands. Cappelle studied a large number of cases of goiter in which operation had a fatal result. In from 92 to 95 per cent. of all cases he found an enlarged thymus. He believes that the thymus has something to do with the fatality. Some years ago, from purely theoretical considerations, Ziesser recommended that a thymectomy be performed before the thyroidectomy. His idea was that the enlarged thymus caused hyperthymization, excessive heart action and dilatation of the heart. If those conditions were counteracted, the thyroidectomy would not prove fatal.

DR. HENRY HULST, Grand Rapids, Mich.: After thyroidectomy the thymus is apt to enlarge suddenly, say within five or six hours. Therefore this is probably not an inflammatory reaction but a vasomotor action, the result of an irritated or stimulated nervous system. If this could be prevented, death following the thyroidectomy would be avoided. I had a patient, a young woman, with a small thyroid and large tonsils. I did not see the necessity of Roentgen treatment, and therefore recommended removal of the tonsils, which was done. A week later tachycardia developed, the thyroid enlarged and the patient manifested all the symptoms of exophthalmic goiter. I gave her Roentgen treatment, but the goiter did not diminish much in size. The symptoms were benefited slightly and the patient was functionally cured. About a year later she developed abscesses in the throat, and all the symptoms of her goiter recurred. She also complained of pain in her right hand. The skiagram showed a cervical rib on the side where there was pain. This case illustrates what compression of the arterial system will do to these ductless glands. We should not forget cervical rib in this connection.

DR. GEORGE E. PFAHLER, Philadelphia: It seems to me that a persistent thymus arteriosus and a dilatation of the first portion of the arch of the aorta would give a picture similar to that of an enlarged thymus. That is a point to be borne in mind in making a differential diagnosis.

DR. PERCY BROWN, Boston: This is a field in which we must proceed with deliberation. A large number of cases should be studied with relation to the possible causative factors of an enlarged thymus and its relation to the goiter. Dr. Crotti's clinical experience is exceedingly valuable, but from the point of view of roentgenology I would advise that we proceed with caution.

DR. RUSSELL H. BOGGS, Pittsburgh, Pa.: Dr. Chevalier Jackson referred a patient to me, a boy about 4 years old, who was said to have swallowed a coin. I made a skiagram, but failed to find a foreign body. There was a shadow in the mediastinum which we took to be an enlarged thymus. Dr. Jackson did a thymectomy and the patient lived for about a year afterward.

MR. H. W. DACHTLER, Toledo: This work is a revelation to me. It may explain why some men have reported unfavorable results and others favorable results after operations on goiter. The enlarged thymus undoubtedly has something to do with the results following thyroidectomy.

DR. A. J. QUIMBY, New York: Three years ago I had three thymus cases in succession. Two of the patients died. In one case no treatment was given. In a second a tracheotomy was done, but failed to give relief. The third patient had a thymectomy performed and is well and hearty to-day. The child was only 21 days old when operated on. The sternum was laid wide open and the thymus removed.

DR. ANDRÉ CROTTI, Columbus, Ohio: I reported only five cases because in these I was able to give the results of autopsy after operation. I have seen other thymus deaths, but did not report them because no skiagrams were taken of those patients. In one case I ligated both upper poles of the thyroid. The patient died suddenly. The post-mortem showed the thymus enormously enlarged. Another patient was an infant born under normal conditions on the morning of the day when I saw it. When it had a choking spell the nurse sprinkled a little cold water on its face, and the baby recovered. At 7 o'clock in the evening it had another choking spell and died. The autopsy showed a thymus larger than the heart. Thymectomy does not do so much good in adults as in children. Garré did a thymectomy in two adults, both of whom recovered. The thyroidectomy was then unnecessary, the patients recovering completely from the hyperthyroidism. In the first case the Graves' disease was far advanced. Much work has been done on the thymus in recent years, but the subject is still in its infancy, especially the physiologic relationship between the thyroid and the thymus. I have done a number of experiments myself, which I shall report later.

Progress of Ankle and Wrist Fracture

DR. E. H. SKINNER, Kansas City, Mo.: The functional result of an ankle-fracture depends on the proper reduction of the astragalus, so that the line of weight-bearing force which passes through the center of the tibia also passes through the center of the astragalus. The interpretation of the skiagram depends not so much on the shadow of the line of fracture as on the shadows of the relative position of the tibia and astragalus. One must judge of the injury therefore, by the position of the astragalus. An accurate knowledge of the normal anatomy of the ankle-joint and of the wrist-joint and the appearance of these joints in the skiagram is an absolute necessity. The secret of a proper reduction of a Pott's fracture lies in the correct adaptation of the astragalus to the tibia. A line drawn through the center of the tibia must extend through the center of the astragalus. This line is easily charted on the skiagram, so that a proper reduction of the fracture can easily be made. A skiagram taken after the reduction will show whether it has been done properly. If the anteroposterior skiagram shows the astragalus centered under the tibia, the prognosis of a functional result will be more favorable than any anatomic alignment of fragments.

In the case of the wrist-joint, in the normal extended hand, the long axis through the center of the radial shaft passes between the proximal epiphyses of the second and third metacarpal bones. A second line drawn at right angles to the first will pass through the tip of the ulnar styloid. If the styloid process of the fractured radial head is behind this line, the fracture is not properly reduced and the result will be a functionally imperfect wrist. Functional result depends on the proper adaptation of the carpal articulating surface of the radius. Normally this surface is tilted slightly forward. It is the tilting back of the radial head that interferes with the function of the wrist. In charting the wrist-joint one must insist on the whole radial styloid being distal to the second right-angled line.

(To be continued)

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARKANSAS: Regular, Little Rock, November 12. Sec., Dr. F. T. Murphy, Brinkley; Homeopathic, Little Rock, November 12. Sec., Dr. P. C. Williams, Texarkana; Eclectic, Marion Hotel, Little Rock, November 12. Sec., Dr. C. E. Laws, Fort Smith.

CONNECTICUT: Regular, City Hall, New Haven, November 12. Sec., Dr. Charles A. Tuttle, 196 York Street; Homeopathic, Grace Hospital, New Haven, November 12. Sec., Dr. Edwin C. M. Hall, 82 Grand Avenue; Eclectic, New Haven, November 12. Sec., Dr. T. S. Hodge, 19 Main Street, Torrington.

FLORIDA: Regular, Jacksonville, November 11-12. Sec., Dr. J. D. Fernandez.

LOUISIANA: Regular, Tulane University, New Orleans, November 4-6. Sec., Dr. A. B. Brown, 108 Baronne Street; Homeopathic, New Orleans, November 4. Sec., Dr. Edward Harper, 702 Macheca Bldg.

MAINE: City Council Rooms, Portland, November 12-13. Sec., Dr. Frank W. Searle, 776 Congress Street.

MASSACHUSETTS: State House, Boston, November 12-14. Sec., Dr. Edwin B. Harvey, Room 159, State House.

MISSISSIPPI: Capitol, Jackson, October 22-23. Sec., Dr. W. W. Smithson.

NEBRASKA: State House, Lincoln, November 13-14. Sec., Dr. C. P. Fall, Beatrice.

NEVADA: Carson City, November 4. Sec., Dr. S. L. Lee.

NEW JERSEY: Capitol Bldg., Trenton, October 15-16. Sec., Dr. H. G. Norton.

NEW MEXICO: Santa Fe, October 14. Sec., Dr. W. E. Kaser, East Las Vegas.

TEXAS: Dallas, November 13-14. Sec., Dr. J. D. Mitchell, Wheat Bldg., Fort Worth.

WEST VIRGINIA: Wheeling, November 11-13. Sec., Dr. H. S. Barbee, Point Pleasant.

Michigan June Report

Dr. B. D. Harison, secretary of the Michigan Board of Registration in Medicine, reports the written examination held at Ann Arbor, June 11-13, 1912. The number of subjects examined in was 14; total number of questions asked, 100; percentage required to pass, 75, and not less than 50 in any subject. The total number of candidates examined was 102, of whom 100 passed and 2 failed. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Bennett Medical College	(1912)	83.3
College of Physicians and Surgeons, Chicago	(1912)	82.4, 84,1, 84.5, 85.1, 86.3, 87.2, 87.4, 93.2.
University of Louisville	(1912)	79.8
Detroit Homeopathic College	(1912)	81
Detroit College of Medicine	(1912)	82.1
University of Michigan, Dept. of Med. and Surg.	(1912)	80.7, 81.1, 81.2, 81.4, 81.5, 81.9, 82.1, 82.5, 82.8, 83.4, 83.8, 83.9, 83.9, 84, 84.2, 84.3, 84.4, 84.5, 84.6, 84.7, 84.8, 84.8, 84.8, 85, 85.2, 85.3, 85.3, 85.3, 85.3, 85.6, 85.6, 85.7, 85.7, 85.8, 85.8, 85.8, 85.9, 86, 86.1, 86.1, 86.1, 86.2, 86.3, 86.4, 86.5, 86.5, 86.6, 86.7, 86.8, 87, 87, 87.1, 87.4, 87.6, 87.8, 88.1, 88.3, 88.4, 88.4, 88.5, 88.5, 88.6, 88.6, 88.6, 88.9, 88.9, 88.9, 89, 89.3, 89.7, 90.6, 92.5.
University of Michigan, Homeopathic College	(1912)	78.8, 80.3, 80.8, 82.5, 83.2, 83.9, 84.8, 85.6, 85.8, 86.3, 86.5, 87.5, 87.7, 88.7, 89.5.
Starling-Ohio Medical College	(1911)	79.8
FAILED		
Laval University, Quebec	(1902)	79.5*
University of Naples, Italy	(1893)	87.9*

* Failed to make the required grade in one subject.

Missouri June Report

Dr. Frank B. Hiller, secretary of the Missouri State Board of Health, reports the written examination held at St. Louis, June 24-26, 1912. The number of subjects examined in was 14; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 186, of whom 158 passed and 28 failed. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
University of Alabama	(1911)	82
University of Arkansas	(1910)	80
Rush Medical College	(1911)	84
Northwestern University Med. School	(1910) 85; (1911)	81
Chicago College of Medicine and Surgery	(1912)	80, 80
National Medical University, Chicago	(1904)	75
University of Kansas	(1912)	78
University of Louisville	(1912)	75, 85, 86
Kentucky School of Medicine	(1893)	76
Johns Hopkins University	(1911) 82; (1912)	82
Marion-Sims College of Medicine	(1898)	80
Ensworth Medical College	(1912)	75
St. Louis College of Physicians and Surgeons	(1911)	75
University Medical College, Kansas City,	(1912)	75, 75, 75, 77, 79, 80, 81, 81, 82, 85, 89.
Washington University, St. Louis,	(1896) 75; (1888) 82; (1901) 78, 78; (1912) 77, 77, 77, 77, 78, 79, 79, 79, 79, 80, 80, 80, 81, 81, 81, 81, 81, 82, 83, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 85, 86, 86, 86, 87, 87, 87, 88, 89.	
St. Louis University,	(1910) 78; (1912) 75, 75, 76, 76, 76, 76, 76, 76, 77, 77, 77, 77, 78, 78, 78, 79, 79, 79, 79, 79, 80, 80, 80, 80, 80, 80, 81, 81, 81, 81, 81, 82, 82, 83, 83, 83, 83, 84, 84, 84, 84, 84, 85, 85, 85, 85, 85, 86, 86, 86, 88, 89.	
Barnes Medical College	(1893) 77; (1904) 80; (1911)	83
Missouri Medical College	(1885) 75; (1886)	75
American Medical College,	(1912) 75, 75, 75, 75, 75, 75, 75, 76, 76, 77, 78, 78, 81, 81, 84, 85.	
Kansas City Hahnemann Med. Coll.	(1903) 75; (1912)	76, 81
Creighton Medical College	(1912)	80
Long Island College Hospital	(1905)	83
Medico-Chirurgical College of Philadelphia	(1909)	81
University of Pennsylvania	(1912)	83
Jefferson Medical College	(1912)	77
Meharry Medical College	(1912)	75, 80
Wisconsin College of Physicians and Surgeons	(1912)	79
University of Edinburgh, Scotland	(1908)	89
FAILED		
University of Arkansas	(1912)	69
University of Louisville	(1910)	59
Univ. Med. Coll., Kansas City	(1911) 49; (1912)	66, 66, 68, 72
St. Louis College of Physicians and Surgeons,	(1906) 58; (1908) 61; (1910) 42; (1911) 63.	
Barnes Medical College	(1910) 68; (1911)	71
Ensworth Medical College	(1909) 36; (1912)	71
American Med. College,	(1911) 63; (1912) 67, 68, 69, 69, 70, 70, 72	
Meharry Medical College	(1910) 63; (1911) 56; (1912)	48, 69
Milwaukee Medical College	(1912)	70

Alabama July Report

Dr. W. H. Sanders, chairman of the Alabama State Board of Medical Examiners, reports the written examination held at Montgomery, July 9-12, 1912. The number of subjects examined in was 10; total number of questions asked, 82; percentage required to pass, 75. The total number of candidates examined was 115, of whom 56 passed and 59 failed, including 2 osteopaths. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Atlanta College of Physicians and Surgeons	(1912)	75
Northwestern University Medical School	(1911)	80
University of Alabama	(1912) 75, 75, 76, 76, 76, 76, 77, 77, 78, 78, 79, 79, 80, 80, 80, 80, 82.	
Birmingham Medical College	(1910) 75; (1912) 75, 75, 75, 76, 76, 77, 78, 79, 79, 80, 82, 83.	
Tulane University of Louisiana	(1909) 81; (1911) 77; (1912) 75, 75, 77, 80, 85.	
Johns Hopkins University	(1910) 79; (1912)	78, 84
University of Maryland	(1912)	78
Leonard Medical School	(1912)	77
Columbia Univ., Coll. of Phys. and Surgs.	(1910)	82
Jefferson Medical College	(1902) 85; (1911) 79; (1912)	78
University of Tennessee	(1908) 75; (1912)	75, 76
Vanderbilt University	(1912)	75
Memphis Hospital Medical College	(1912)	75, 79
University College of Medicine, Richmond	(1912)	81
University of Virginia	(1910)	82
FAILED		
Birmingham Medical College	(1911) 54. 68; (1912) 60, 62, 63, 63, 64, 64, 65, 65, 67, 68, 68, 69, 69, 69, 70, 73; (1912)*	
University of Alabama	(1910) 67; (1911) 69; (1912) 57, 66, 70, 71, 72, 72, 73.	
Howard University, Washington, D. C.	(1910)	72
Atlanta School of Medicine	(1911) 59; (1912)	54
Atlanta College of Physicians and Surgeons	(1912)	64, 67
University of Louisville	(1912)	42
Tulane University of Louisiana	(1911) 68; (1912)	71
Harvard Medical School	(1909)	73
Leonard Medical School	(1905)	57
Jefferson Medical College	(1912)	68
University of Pennsylvania	(1911)	72
University of Nashville	(1908)	73
Chattanooga Medical College	(1908)	73
Memphis Hospital Medical College	(1910) 55; (1911) 41, 62, 67; (1912) 64, 65.	
Meharry Medical College	(1908) 51; (1910) 43; (1912)	63, 66, 69
University of Tennessee	(1912)	70
Vanderbilt University	(1912)	68
University of Virginia	(1909)	72

* No grade given.

The following questions were asked:

ANATOMY

1. Discuss the upper third of the humerus, giving its articulations. 2. Name the muscles proper to the shoulder, describing the deltoid. 3. Give the origin and the relations of the iliohypogastric and ilioinguinal nerves in the inguinal region; also their distributions. 4. Describe the renal circulation. 5. Describe the right spermatic vein. 6. Name the groups of the mediastinal lymphatic glands, locating and describing the posterior group. 7. Describe the anatomy of the cecum and appendix. 8. Describe the structure of the mammary gland.

CHEMISTRY

1. Define the following terms: (a) valence; (b) atomic weight; (c) specific gravity; (d) chemical formula. 2. How does chlorin occur in nature? How may it be prepared or obtained? Give the properties and uses. 3. What reaction occurs when sodium bicarbonate is mixed with diluted sulphuric acid? Give the chemical equa-

tion. 4. Give the physical properties of bone; mention the chemical constituents and give the properties of the most important of these constituents. 5. Give the elementary constituents and name any carbohydrate; also the names and formulas of the products of its complete combustion. 6. Give the formula and name of: (a) an alcohol; (b) an organic acid; (c) a compound ether; (d) a hydrocarbon. 7. What occurs when a solution of sodium hydrate is mixed with normal urine? Explain the reaction. 8. Describe a test for indican. How may sugar be determined quantitatively?

PHYSIOLOGY

1. Discuss the distribution and function of the recurrent laryngeal nerve. 2. Describe the mechanism by which the pylorus is controlled. 3. Describe the metabolism of proteids with special reference to end-products. 4. Describe the mechanism by which the equilibrium of the body is maintained in the standing position. 5. Discuss the portal circulation. 6. Discuss briefly the histologic constituents of blood and the function of each. 7. Discuss the olfactory sense (the mechanism of smelling; the nature of the olfactory stimulus). 8. What relation has the vasomotor system to blood-pressure? What is the approximate normal adult blood-pressure and how ascertained?

ETIOLOGY, PATHOLOGY, SYMPTOMATOLOGY AND DIAGNOSIS OF DISEASES

1. Give the pathology and differential diagnosis of acute infectious cholecystitis. 2. Give the pathology of aortic incompetency and the mechanical effects of the lesion. 3. Give the etiology, pathology and differential diagnosis of hydronephrosis. 4. Give the pathology of mitral incompetency and the mechanical effects of the lesion. 5. Give the pathology and diagnosis of hookworm disease. 6. Give the incubation periods of measles, scarlet fever, small-pox and chicken-pox. 7. Give the diagnosis of abscess of the liver. 8. Give the diagnosis of cerebrospinal meningitis.

SURGERY

1. Discuss the relative merits of the three principal general anesthetics and tell how a patient should be prepared for the administration of any one of them. 2. Describe the process of repair of tissues and define healing by granulation. 3. In what varieties of gangrene would immediate operation be demanded without waiting for the line of demarcation? 4. Give technic of first service in accidental wounds, including incised, contused and lacerated wounds. 5. Give the management of a compound, comminuted fracture of the femur. 6. Give the proper procedure in a penetrating gunshot wound of the abdomen. 7. Name surgical conditions that cause indigestion. 8. Give diagnosis and treatment of stone in the right ureter.

OBSTETRICS AND OBSTETRIC OPERATIONS

1. Name the pelvic articulations, and describe briefly the true and the false pelvis. 2. Give the process by which the fetal blood is oxygenated; give the fetal circulation and the changes which take place in it after birth. 3. Describe the methods by which you would ascertain the position of the child *in utero*. 5. Give the mechanism of labor in the first position of the vertex, and name the diagnostic landmarks found on the fetal head. 6. Give probable causes of nausea and vomiting of pregnancy. 7. Give the indications and conditions requiring cesarean section, and give the technic of the operation. 8. Name the organisms causing puerperal infection, and give modes of external infection.

GYNECOLOGY

1. Name the uterine displacements, and give the cause of each. 2. Give causes and treatment of infantile uterus. 3. Name the neoplasms which may be found in the ovaries. 4. Give the classification of uterine tumors from a histologic and anatomic standpoint. 5. Give the early symptoms of carcinoma of the uterus. 6. What ducts in the female urethra may become infected, and to what may infection lead? 7. Describe the levator ani muscle. 8. Give the causes of dysmenorrhea.

HYGIENE AND MEDICAL JURISPRUDENCE

1. Define disinfectants, deodorants, germicides. 2. How long does a diphtheritic patient remain infective, and how may it be shown that the infective period has passed? 3. If on chemical examination nitrates and nitrites are found in water, would this fact condemn such water for drinking purposes? If so, why? 4. What is the difference between a parasite and a saprophyte? 5. Into what general classes are foods divided? Give examples of each. 6. Give the prophylaxis of uncinariasis. 7. What is coma? Give three causes of coma. 8. In what respects do gunshot wounds differ from other wounds?

DISEASES OF THE EYE, EAR, NOSE AND THROAT

1. What kind of tissue is the conjunctiva? Name the principal diseases that affect it, and give the management of two common and important ones. 2. Give the symptoms, causes and management of acute dacryocystitis. 3. In a penetrating wound of the cornea of some size what would happen? Give the management of the condition. 4. Give the symptoms, dangers and management of glaucoma. 5. Differentiate between impacted cerumen and a considerable degree of paralysis of the auditory nerve, and give the treatment of the former. 6. Discuss the subject of earache and its management. 7. Discuss the subject of aphonia. 8. Name two conditions that would demand laryngotracheotomy and describe the operation.

New Hampshire July Report

Mr. H. C. Morrison, Regent of the New Hampshire State Board of Medical Examiners, reports the written examination held at Concord, July 9-10, 1912. The number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 16, of whom 11 passed and 5 failed. Five candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
University of Maryland	(1904)	85
Baltimore Medical College	(1912)	83
Medical School of Maine	(1910)	81
Tufts College Medical School	(1912)	84
Boston University	(1889)	93; (1910) 90
Dartmouth Medical School	(1912)	83
Long Island College Hospital	(1911)	77
Columbia University, College of Phys. and Surg.	(1911)	80
University of Nashville	(1911)	84
University of Vermont	(1911)	79

FAILED

Medical School of Maine	(1879)	73
Baltimore Medical College	(1907)	72
Maryland Medical College	(1912)	61, 73
Dartmouth Medical School	(1910)	62

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
George Washington University	(1907)	Dist. Colum.
Rush Medical College	(1882)	Wisconsin
Baltimore Medical College	(1898)	N. Dakota
University of Vermont	(1903) (1910)	Vermont

Nebraska August Report

Dr. C. P. Fall, secretary of the Nebraska State Board of Health, reports the written examination held at Lincoln, Aug. 13-14, 1912. The number of subjects examined in was 14; total number of questions asked, 10; percentage required to pass, 75. The total number of candidates examined was 15, of whom 12 passed and 3 failed. Four candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Northwestern University Medical School	(1912)	77.9
Rush Medical College	(1912)	80
Chicago College of Medicine and Surgery	(1912)	78.2
State University of Iowa, Homeopathic College	(1897)	82
University of Louisville	(1909)	86.2
Harvard Medical School	(1912)	83
Creighton Medical College	(1912)	75.9, 76.5, 77.4, 83.2
Cotner Medical College	(1912)	76
University of Nebraska	(1912)	86

FAILED

Ensworth Medical College	(1912)	68.4, 70
Creighton Medical College	(1911)	69.2

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Rush Medical College	(1894)	Maine
Hahnemann Med. College and Hospital, Chicago	(1911)	Tennessee
Iowa College of Physicians and Surgeons	(1889)	Iowa
Drake University	(1908)	Iowa

Book Notices

DIGEST OF COMMENTS ON THE PHARMACOPEIA OF THE UNITED STATES OF AMERICA (EIGHTH DECENNIAL REVISION) AND ON THE NATIONAL FORMULARY (THIRD EDITION) FOR 1910. By Murray Galt Motter and Martin I. Wilbert. Paper. Pp. 784. Public Health Service of the United States, Hygienic Laboratory, Bulletin 84. 1912.

The present bulletin is the sixth of the series of "Digest of Comments" on the Pharmacopeia of the United States and the National Formulary. These books, which are now being revised, are recognized, as is well known, by the Food and Drugs Act of June 30, 1906, as the standard authority with reference to the identity, purity and strength of the medicaments therein described and hence are of direct interest and value as public health measures.

In the compilation of the present bulletin the available literature for 1910 has been reviewed and, in addition to routine matter of interest to the revisers of the Pharmacopeia and the National Formulary, the book contains comments on the proceedings of the United States Pharmacopeial Convention which was held in Washington in May, 1910. An effort has been made to digest the comments on the Pharmacopeial Convention and to give an outline of the proceedings so as to make them readily available for reference. The general principles to be followed in revising the Pharmacopeia, endorsed by the United States Pharmacopeial Convention, are reproduced and the comments on the nature and extent of the general principles are reflected at some length.

As in previous bulletins of this series, considerable space is devoted to the consideration of the possible development of international standards for potent medicaments, and the gradual compliance of foreign pharmacopeias with the provisions of the treaty signed at Brussels in 1906, embodying principles

for securing uniformity in the nomenclature and dosage of potent medicaments, is noted. The extent to which the several pharmacopeias published since 1905 comply with the requirements of the Brussels Protocol has been analyzed and is given in the form of tables, accompanied also by a table showing the comparative scope and the content of the several pharmacopeias, and several tables indicating the extent to which the newer remedies have been recognized in recent editions of national pharmacopeias.

A table giving the comparative strength of preparations of potent medicaments included in the Brussels Conference Protocol and in the several pharmacopeias used in North and South America show the need for pan-American uniformity in preparations of this kind.

The references to materials used in clinical laboratories for the scientific study of disease and the comments on the development and standardization of disinfectants and other prophylactic measures for the prevention of disease will be of value to all physicians who are in any way interested in clinical laboratory investigations. As an illustration of the extent to which material of special interest to physicians has been recognized it may suffice to point out that the references to clinical tests cover twenty-one pages of text and that fifteen pages are devoted to the enumeration of references on serums and vaccines.

In addition to their direct use as a ready reference to the comments on the articles included in the Pharmacopeia and the National Formulary, these bulletins will also be found to be of value as a summary of the current literature relating to the pharmacy and therapy of widely used medicaments. The bulletin can be had on application to the Surgeon-General, U. S. Public Health Service, Washington, D. C.

INFANT MORTALITY AND MILK STATIONS. Special Report Dealing with the Proolem of Reducing Infant Mortality. Work Carried On in the Ten Largest Cities of the United States. Together with Details of a Demonstration by Public and Private Agencies in New York City During 1911 to Determine the Value of Milk-Station Work as a Practical Means of Reducing Infant Mortality. Edited by Philip Van Ingen, M.D., Member of the New York Milk Committee, and Paul Emmons Taylor, Secretary of the New York Milk Committee. Paper. Price, $1. Pp. 176, with illustrations. New York Milk Committee, 105 E. 22d St., New York City, 1912.

This pamphlet of 176 pages contains a report dealing with the problem of reducing infant mortality as carried on in ten of the largest cities of the United States, together with details of a demonstration by public and private agencies in New York City during 1911 to determine the value of milk-station work as a practical means of reducing infant mortality. Among the subjects discussed are the factors concerned in the waste of infant life, a summary of what has been done in New York in recent years along this line; the results obtained in New York City as a whole, in 1911, the results obtained at individual milk stations, and a comparison of the figures obtained in New York with those of nine other large cities. This information is set forth in the text, in tabulated form and by graphic representations in the form of charts, curves and pictures.

Among the conclusions reached are the following: During the first part of the summer of 1911, although meteorologic conditions were not favorable to a low mortality in the cities studied, the reduction was very marked. This reduction was not due to chance, it is believed, but bears a close relation to the activity of the campaign. The interesting observation is made that the difference between cities in infant mortality rates is probably more a matter of public conscience and quality of official endeavor than of weather and character of population. It is believed that in the education of the mother in the care of herself and baby lies the strongest weapon for fighting infant mortality. This work has proved the usefulness of the milk-station, which is considered one of the most efficient educational factors in prevention; and it is believed that its usefulness can be greatly extended into other branches of infant and child welfare, such as prenatal work, the care of children under school age, follow-up work in the inspection of school children, etc. It is believed that, when efficiently managed, the milk-station is an economical means of forwarding the movement for infant welfare. While private agencies are useful in initiating milk-station work, yet all this work should sooner or later come under the supervision of the municipality. The report shows that with a low infant mortality, only 28 per cent. of infant deaths occurred during the three summer months in Manhattan, while the preceding ten years averaged 33.8 per cent. Notwithstanding the fact that the first part of July was the most unfavorable since 1901, the death-rate during that month was the lowest since 1901, not even taking into consideration the increase in population. This detailed report of intensive work in infant conservation through milk-station work is important as affording a definite basis for estimating the value of this phase of the infant welfare movement.

DIE GOLDSCHMIDTSCHE IRRIGATIONS-URETHROSKOPIE. Eine zusammenfassende Darstellung der Methode. Von Dr. A. Schlenzka. Paper. Price, 4.50 marks. Leipsic: Werner Klinkhardt, 1912.

This monograph on the use of the Goldschmidt urethroscope describes the uses of this instrument in the examination and treatment of the normal and diseased urethra. The first part is taken up with the description of the mechanics and optics of the instrument. Next are described the preparation of the patient and the use of the instrument in the normal and pathologic urethra.

The uses of the instrument in making instillations and operations under the eye are thoroughly described, particularly the Bottini operation. The book is well illustrated both by colored plates of the different pathologic pictures and by line drawings of the different instruments.

HERZMISSBILDUNGEN. Ein Atlas angeborener Herzfehler in Querschnitten mit besonderer Berücksichtigung des Atrioventrikularsystems. Von J. G. Mönckeberg, A. O. Professor an der Universität Giessen. Paper. Price, 30 marks. 114 illustrations. Jena: Gustav Fischer, 1912.

Mönckeberg presents, in the form of an atlas, outline drawings of a series of cross-sections of hearts showing congenital malformations. The specimens selected were imbedded in paraffin, sectioned, and serial sections stained to show the relations of vessels, valves, musculature and "central fibrous body." The specimens shown include eight cases of septum defects and other anomalies in development of the aorta and its branches.

Medicolegal

Construction and Validity of Powers Conferred on State Board of Medical Examiners

(Barton vs. Schmershall et al (Idaho), 222 Pac. R. 385)

The Supreme Court of Idaho in sustaining a motion to quash, or denying a writ of mandate against the State Board of Medical Examiners, says that, under the provisions of section 1342 of the Revised Codes of Idaho, as amended in 1909, the legislature grants power to the board of examiners to determine the qualification of applicants to practice medicine: First, by examination; second, without examination on the applicant presenting to the board satisfactory proof of the existence of certain facts with reference to the qualification of the applicant. When application is made for license without examination, certain questions of fact are to be determined, as follows: First, that the applicant has been licensed to practice medicine by a similar board of another state; that is, whether the applicant has been licensed, and whether it was by a board similar to the examining board of Idaho. Second, that the applicant holds a certificate of registration showing that an examination has been made by the proper board of any state in which an average grade of not less than 80 per cent. was awarded to the holder thereof. Third, that the applicant was the legal possessor of a diploma from a medical college in good standing in any such state, which said diploma may be accepted in lieu of an examination as evidence of qualification. Fourth, that the scope of such examination was not less than prescribed in Idaho.

In determining these questions of fact, the board is not required to accept the statement of the applicant or his affidavit as conclusive proof that the board of any other state was in fact a similar board to the board of examiners of Idaho, or that the applicant holds a certificate of registration showing that

an examination has been made by the proper board of any other state in which an average grade of not less than 80 per cent. was awarded to the holder thereof, or that the examination given him in another state was similar in scope to that conducted by the board of this state, or that the applicant was the legal possessor of a diploma from a medical college in good standing in any such state, or that the board issuing to him a certificate in another state accepted the diploma from the Bennett Medical College of Chicago, Ill., as a medical college in good standing in that state and in lieu of an examination. The statute does not in any way limit the medical board in determining the qualification of an applicant to any particular character or kind of proof, and the board is possessed with power to determine these questions on such evidence as will satisfy the minds of the members of the board as to whether or not the applicant is qualified as required by the law and the rules of the board.

The power thus conferred on the board of medical examiners has been considered by this court in a number of instances, in each of which it has held that the statute confers discretionary power and judgment on the board in determining the questions of fact presented by the application, and also the qualification of the applicant from his examination, and it might either grant or refuse a license according to the judgment of the board. In other words, where the statute requires an examination of an applicant, the statute also confers power on the board to determine the qualifications of the applicant and whether the examination shows the applicant to be qualified under the statute.

The legislature has the power to regulate the practice of medicine and surgery within the state, and in doing so it may require applicants to practice medicine and surgery to pass an examination under the supervision of an examining board, and such board may be given power to determine the qualifications of the applicant to receive a license, and the action of such board may be reviewed only in the manner and for the purpose provided by the statute.

In enacting a law regulating the practice of medicine and surgery within the state, the legislature had in mind the protection of the people of the state against those not qualified for such service. The members of the board under the provisions of the law are required to be graduates of reputable medical colleges in good standing, and learned and skilled in the theory and practice of medicine and surgery and of good moral repute. The legislature could not have selected a tribunal or board which could be more skilled or better qualified than one composed of persons qualified in the manner prescribed by the statute.

The court is unable to agree with the contention that "may" should read "must," and that the board must grant a license with examination only in the branches not covered by the examination held in another state, or that the board must grant a license without examination if the scope of such examination in another state was not less than prescribed in Idaho. Many authorities were cited with reference to whether the word "may" in a statute is to be construed as mandatory; but, as this court understands it, the construction to be applied to this statute is that "statutes will be construed with a view to ascertain the intent of the lawmaking power and to give force and meaning to the language used." No unusual interpretation should be permitted or is required in this case to give force to the clear policy and intent of the legislature in enacting this statute. The statute was intended to require a certain standard of proficiency and skill in order to qualify an applicant to practice medicine and surgery within the state, and to grant to the board of examiners the power to determine the proficiency and skill of the applicant. This statute is intended for the common good of the people of the state, and is clearly within the police power of the state. The determination of the questions of fact required to be established by an applicant for a license to practice medicine and surgery within this state may be reviewed in the manner prescribed by the statute, and, if the applicant has been deprived of any legal right, it may be corrected by the courts of the state; but the court will not interfere with or disturb the discretionary power conferred on the board.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Archives of Internal Medicine, Chicago

September 15, X, No. 3, pp. 169-296

1 *Influence of Adrenals Over Pancreas. R. Pemberton and J. E. Sweet, Philadelphia.
2 *Absorption of Food in Typhoid. E. F. Du Bois, New York.
3 *Effect of a Skin Irritant on Local Blood-Flow in Hand. C. I. Wood and P. G. Weisman, Ann Arbor, Mich.
4 Presence in Urine of Certain Pressor Bases. A. S. Granger, Los Angeles.
5 *Criticism of Two Percussion Methods for Diagnosis of Enlarged Thymus. E. A. Park and W. C. McGuire, New York.
6 Effect of Tuberculo-Toxin on Adrenal Function. L. H. Newburgh, Boston, and T. H. Kelly, Cincinnati.
7 Auscultatory Blood-Pressure Phenomena. L. M. Warfield, Milwaukee, Wis.
8 *Persistence of Action of Digitalis. R. A. Hatcher, New York.
9 Pellagra in Illinois: Condensed Report of Illinois Pellagra Commission.

1. **Influence of Adrenals Over Pancreas.**—The authors found that injections of epinephrin made when the flow, following removal of the adrenals, is at its height, inhibit the flow. Shortly after or before the blood-pressure falls to its previous level, the pancreatic flow returns. It can thus be repeatedly inhibited and it then repeatedly returns. The tendency to flow seems very strong. Since removing the adrenals induces a flow and since injections of epinephrin then inhibit the flow; and since the flow returns when the effect of the injection wears off (which last can be repeatedly demonstrated in one animal), it is difficult to escape the thought that there is normally some such relation between these glands.

2. **Absorption of Food in Typhoid.**—In the cases studied by Du Bois carbohydrates when given in amounts under 300 gm. a day were present in the stools only in traces, if, indeed, they were present at all. When amounts larger than 300 gm. were given, the stools sometimes contained 2 or 3 gm. of reducing bodies. The nitrogen of the feces averaged 1.12 gm. a day, and never exceeded 1.8 gm., amounts which are within normal limits. The loss was 7.1 per cent., which is a figure lower than that of previous observers. This, perhaps, may be due to the fact that the diet was less irritating to the intestinal tract. With the fats there seemed to be a diminution of both the percentage loss and the actual weight of fat in the feces as the disease progresses. Du Bois says it is hard to give averages which are fair, but it can be said that during the first three weeks of the attack and during the height of a relapse, the patients lose on an average 7.2 per cent. of the ingested fat. Later in the disease, with a falling temperature and decreasing toxemia, they lose about 4.5 per cent. The average loss for all cases examined was 6.02 per cent., which, though higher than the normal figure of 3 per cent. for a similar diet, is not enough higher to be of any clinical significance. The dried feces contained from 30 to 50 per cent. fat. However, very large amounts of fat were given. The stools of typhoid patients on the high calory diet resemble normal stools very closely. The indican of the urine, which is rather high during the early part of the disease, decreases steadily as the patient's condition improves. The indican excretion compares favorably with that of Folin's normal individuals. Du Bois concludes that typhoid patients throughout the disease can absorb carbohydrates and protein as well as normal individuals. They can absorb very large amounts of fat, but the percentage of absorption is somewhat lower than normal, especially early in the disease.

3. **Effect of Skin Irritant on Local Blood-Flow in Hand.**—In order to ascertain the effect of the irritants, determinations were made by Wood and Weisman simultaneously on the two hands while one was exposed to water containing the irritant and the other to ordinary tap water. In this manner it was possible to eliminate the variations in flow which occur in a single individual at different times. Scrupulous care was taken to maintain the two water baths at the same temperature in order to exclude the effect of local variations in temperature. They found that irritation of the skin by a mustard bath short of producing a definite dermatitis does not materially increase the rate of blood-flow through the hand relative

to the hand whose skin is not so irritated. They believe that the local redness is probably due to a dilatation of the cutaneous capillaries and venules without a corresponding dilatation of the underlying arterioles.

5. **Percussion Methods for Diagnosis of Enlarged Thymus.**—The authors' conclusion, from an anatomic study of autopsy cases is that percussion methods of the thymus, based on the theory of thymus mobility, are founded on a false anatomic hypothesis.

8. **Persistence of Action of Digitalins.**—An attempt was made by Hatcher to determine approximately the length of time during which the action of several of the digitalins persists after the introduction of suitable doses directly into the circulation. He attempted to estimate the latent action of the digitalins as well as that which induces symptoms which are readily observed; in other words, he tried to determine the length of time during which the action of a single large dose, or repeated doses, of these bodies persists, and the relative intensity of the persisting action after a given interval of time. His results were as follows: The production of the phenomena commonly called "cumulation" of the digitalins, depends on the relationships existing among a number of factors, including absorption, elimination and persistence of action, all of which are in need of investigation. The use of the term cumulation tends to perpetuate a misconception. The actions of the digitalins persist for periods of time which vary widely with the different members of the group, and with the species of animal employed. The actions of digitoxin and digitalis persist longer than do those of the other digitalins in common use. The cat shows this persistence of digitalis action much longer than the dog, rabbit or white rat. The cardiac actions of a single very large intravenous dose of digitalis or digitoxin may persist for a full month in the cat, but for only a few hours in the rabbit. The action of the largest sublethal dose of digitalin, ouabain or strophanthus persist for only a day, or, at most, a few days, in the cat. Hatcher says that it remains for the clinician to determine whether the long-lasting action of digitalis or the briefer action of strophanthus is to be preferred in a given condition of cardiac disease, but strophanthus cannot rival digitalis in general use until we learn more of the conditions governing its absorption from the gastro-intestinal tract, and of this we know practically nothing at present.

To avoid accidents, careful regulation of the therapeutic dosage of the digitalins is necessary especially when they are so used as to elicit action promptly during the period when the action of a previously used digitalin persists, and it must be remembered that every digitalin is a synergist of every other member of the group. All of the digitalins maintain their relative position with regard to activity, so far as he has tested them on different mammals by intravenous injection, and digitoxin has never been found by any observer to be as active as crystalline ouabain when tested on mammals in this way; hence there is no sufficient reason for the wide-spread belief that digitoxin is enormously toxic for man, as compared with other digitalins. No fixed ratio of activity can be determined for the digitalins when they are administered orally, because of great differences in the rate of absorption from the gastro-intestinal tract. The full effects of moderately large doses of digitoxin are not exerted on the heart at once even when they are administered intravenously, but severe symptoms of poisoning may be elicited in a few seconds, and death may occur within two minutes, after the intravenous injection of a very large dose of digitoxin.

The rabbit eliminates certain of the digitalins, at least, with a rapidity hitherto unsuspected, and previous studies of the so-called cumulative actions of these bodies, in which they were administered orally, or subcutaneously to rabbits, lead to wholly erroneous conclusions. Changes in the pulse-rate amounting to fifty beats per minute occur spontaneously in the cat and the rabbit, and large doses of digitalis often fail to elicit any constant changes in the pulse-rate of these animals; hence such changes as may occur after the administration of the digitalins to these animals afford no trustworthy indication of the persistence of action of the digitalins.

Further studies of the digitalins are in progress in Hatcher's laboratory, among the problems under investigation being those of absorption from the gastro-intestinal tract; the rate at which the digitalins leave the blood-stream; their elimination from the organism; their storage in the tissues, and their persistence of action.

Journal of Missouri State Medical Association, St. Louis

September, IX, No. 3, pp. 73-106

10 Vaccine Treatment of Skin Diseases. H. M. Lyle, Kansas City.
11 Prostatic Hypertrophy; Its Etiology, Pathology, Diagnosis and Treatment. W. T. Elam, St. Jospeh.
12 Anesthesia by Intratracheal Insufflation of Air and Ether. W. E. Leighton, St. Louis.
13 Medical Economics. A. H. Madry, Aurora.
14 Fractures of Larynx. W. E. Sauer, St. Louis.
15 Roentgen-Ray in Postoperative Sarcoma. W. L. Brosius, Gallatin.
16 Gastric Hemorrhage Occurring After Abdominal Operation. M. W. Myer, St. Louis
17 Two Phases of Chronic Appendicitis. J. C. Lyter, Moberly.
18 *Auto-Intoxication; Its Medical Aspect. J. M. Bell, St. Joseph.

18. Abstracted in THE JOURNAL, July 6, p. 59.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

September, LXVI, No. 417, pp. 341-508

19 Relation of Athletics to Reproductive Life of Woman. A. Parry, New York.
20 Pituitary Extract in Inertia Uteri. O. P. Humpstone, Brooklyn.
21 *Primary Uterine Inertia. G. H. Ryder, New York.
22 *Case of Streptococcemia Due to Streptococcic Infection of a Submucous Fibroid. H. N. Vineberg, New York.
23 Statistics in Radical Operation for Cancer of Cervix Uteri. J. W. Bovée, Washington, D. C.
24 *Perineorrhaphy in Principle and in Practice. A. Sturmdorf, New York.
25 Hodgkin's Disease Involving Uterus. D. S. D. Jessup, New York.
26 Consideration of Paragraph 79 of the "Page Law" and Method of Its Administration in This City. F. Bierhoff, New York.
27 Course, Prognosis and Treatment of Endocarditis in Children. W. C. Calhoun, New York.
28 Some Physical Conditions Underlying Backwardness, from Standpoint of General Practitioner. A. E. Schmitt, New York.

21. **Primary Uterine Inertia.**—Of five cases of primary uterine inertia treated by Ryder by the stimulating method, four of the five fetuses were lost. In nine cases treated by the "waiting" method, eight fetuses were saved. One was lost because of a prolapsed cord. In every case except one, labor finally started again spontaneously (one after three weeks, two within one hour, one within two days, and four within four days). After so starting the pains were satisfactory, so much so, that three had normal deliveries, and in the others sufficient progress was made to permit of easy artificial deliveries. The membranes were not ruptured artificially except in two cases, in one of which the cervix was entirely obliterated, and in the other the head was well below the brim of the pelvis. The inertia in these nine cases was as persistent as in the five, and Ryder is convinced that continued attempts to overcome it, especially rupturing of the membranes early, would have led to similarly poor results.

The danger of rupturing the membranes artificially in primary inertia, before the cervix is fully dilated, or before the head is well within the brim, is strongly emphasized. When from previous history, or appearance of the patient, inertia is apprehended, Ryder says, remedies to build up the patient's general health should be used, long before the onset of labor. Strychnin thus used, as advocated by Edgar, may be beneficial. But attempts to induce labor should not be made, unless indication is urgent. If labor must be induced, the dilating bag is better than the bougie, for it is less likely to cause rupture of the membranes. In primary inertia he does not rupture the membranes artificially, unless the cervix is entirely obliterated, or the head is well within the brim, for if inertia still persists, delivery must be accomplished entirely by the obstetrician, through a cervix not fully dilated, or with the fetal head not well molded. It is generally safer to let the membranes rupture spontaneously. The treatment of primary inertia therefore depends largely on whether the membranes are intact or not. When intact, waiting does no harm, and is usually the best treatment. If necessary, the uterus should be quieted with morphin or chloral. Trying to hurry the labor, or to whip the uterus to action, is often useless and dangerous, and in the absence of urgent indication

should not be done. It is better to wait for labor to start again spontaneously. When the membranes are already ruptured, waiting for any length of time (over twelve to twenty-four hours) is usually dangerous, especially to the fetus, and active measures should be taken to end labor.

The treatment of secondary inertia is very different. In secondary inertia there is always some cause outside of the uterine muscle. This should be excluded, and no diagnosis of primary inertia should be made if such a cause be present. Primary inertia is most frequently seen and is of chief importance in the first stage of labor. It gives relatively little concern in the second and third stages. There does not seem to be marked tendency to post-partum hemorrhage after primary inertia, but this should be guarded against. Large doses of ergot are useful at the end of labor, and if the uterus does not contract, packing prevents hemorrhage. Cesarean section has a place in primary uterine inertia, and should be seriously considered even in the absence of obstruction. It is absolutely safe for the fetus, and is often safer for the mother than a hard forceps operation or a breech extraction.

22. **Case of Streptococcemia.**—When obscure toxemia or general infection suddenly manifest themselves in a patient with uterine myomata, Vineberg says we must bear in mind the probability of a bacterial infection of the growth and act accordingly.

24. **Perineorrhaphy in Principle and Practice.**—Sturmdorf describes his method of perineorrhaphy consisting in levator interposition and suture. The operation comprises four essential steps. 1. Exposure of the seat of lesion. 2. Mobilization of the muscles. 3. Suture interposition of the muscles. 4. Readjustment of the superficial coverings. From three to four interrupted, twenty-day chromic gut sutures coapt the muscles and close the intermuscular gap in front of the rectocele; each suture is passed from side to side not through but entirely around both muscles, encircling them so as to secure their broadest possible surface contact under the vaginal floor. The rectocele is not caught in the suture nor pinched between the muscles, the uppermost suture being inserted just high enough to normally appose the lower to the upper vaginal wall. In adjusting the superficial coverings no vaginal mucosa is removed; the transverse wound is converted into a perpendicular slit by properly applied traction, and the edges united side to side by continuous or interrupted plain gut suture. From the tip of the vaginal flap to the caruncles the suture includes vaginal mucosa only, while from the caruncles downward, each stitch is made to gather the skin and all of the fascial layers which are drawn from under the lateral edges of the wound toward the median line. The resultant comb of vaginal flap is tucked into the vagina and the operation completed by the introduction of a gauze strip to absorb the first oozings.

Journal of Kansas Medical Society, Kansas City

September, XII, No. 9, pp. 341-380

29 The Medical Profession. C. C. Goddard, Leavenworth.
30 Surgery of Thyroid. D. W. Basham, Wichita.
31 Closer Supervision of Pregnancy. H. L. Chambers, Lawrence.
32 Some Experiences as Health Officer. W. T. Grove, Eureka.
33 Pellagra. J. J. Tretbar, Hudson.

Journal of Infectious Diseases, Chicago

September, II, No. 2, pp. 141-293

34 Is Typhoid a "Rural" Disease? W. T. Sedgwick, Boston; G. R. Taylor, Scranton, Pa., and J. S. MacNutt, Orange, N. J.
35 Sporotrichosis in United States. G. F. Ruediger, Grand Forks, N. Dak.
36 *Simple Method for Isolating Anaerobes in Pure Culture. J. P. Simonds and A. I. Kendall, Boston.
37 *Experimental Infectious Endocarditis. E. C. Rosenow, Chicago.
38 *Variations in Complement Content of Serum and Plasma. F. B. Gurd, Montreal.
39 *Nature of Toxic Substance from Pneumococci. E. C. Rosenow, Chicago.
40 *Experimental "Rheumatic Myocarditis." L. Jackson, Chicago.
41 Study of Diphtheria Group of Organisms by Biometrical Method. M. E. Morse, Boston.
42 Toxicity of Broth, of Pneumococcus Broth Culture Filtrates and Nature of Proteolytic Enzyme Obtainable from Pneumococci. E. C. Rosenow, Chicago.

36. **Simple Method for Isolating Anaerobes in Pure Culture.**—The following method has been used with great success by Simonds and Kendall. Sixteen-ounce, French square, wide-mouthed bottles are plugged with cotton and sterilized by dry heat. With the bottles lying on their sides, sufficient blood agar is poured in to form a layer 2 to 5 mm. in thickness, and allowed to harden. As soon as the agar has hardened, the bottles should be turned on the opposite side, thus bringing the medium uppermost and preventing the water of condensation from running down on it. If sterile blood for blood agar plates is not available Dorset's egg medium to which 1 per cent. of dextrose has been added may be used. The medium is run into the bottles which must be kept lying on their sides, coagulated, and sterilized in the same way as Dorset's medium. By bringing up the temperature very slowly, the sterilization may all be done at once by heating in the autoclave for fifteen minutes under 10 pounds' pressure. As the colonies are difficult to see on this yellowish-white medium, this difficulty should be obviated by the addition of litmus to the medium before sterilization. Under the anaerobic conditions produced in the bottle after inoculation, the litmus is more or less completely bleached. After the readmission of air, however, the color soon returns and assists very materially, not only by rendering the colonies more easily visible, but also by differentiating acid producers.

37. **Experimental Infectious Endocarditis.**—Five strains of the cocci used by Rosenow were isolated from the blood and two from the tonsils of cases of subacute or chronic infectious endocarditis. All produced a variable amount of green on blood agar plates, all fermented inulin at one time or another, and at the time of the experiments the growths adhered to the surface of blood agar and formed clumps in broth. All the strains were freely susceptible to phagocytosis and non-virulent in the usual sense. Suppuration and diffuse peritonitis could not be produced. The cocci injected were usually grown both on blood agar and in ascites-dextrose-broth; in the latter case, the cocci were removed and suspended in suitable amounts of salt solution. The dose, relatively speaking, in most instances was exceedingly large, so large that the amount of the injected material was often sufficient to kill in twenty-four hours.

Localization on the valves, Rosenow says, is an embolic process and not due to implantation. The clumps of bacteria lodge in the capillaries, produce hemorrhage, and probably because of the relatively slight vascularity in the valves the organisms grow into clumps before leukocytes are able to cause their destruction. Hemorrhages and endocarditis occur at the apex of papillary muscles in the same way. Hemorrhages occur at the base of the semilunar valves also, and vegetations have been seen to grow from this region. In the rabbits which died or were killed soon after the injection, hemorrhages were observed in all experiments as follows: tricuspid valve, twenty-eight times; mitral, nine times; base of aortic semilunar valve, four times; base of pulmonary semilunar valve, three times; in papillary muscles (chiefly at apex), twenty times; kidney, usually glomerular, eleven times; subendocardial (other than papillary or valvular), four times; lungs, seven times. General subserous hemorrhages were seen six times. Valvular hemorrhages occurred repeatedly without hemorrhages elsewhere. This was especially true if the dose was not sufficient to kill the animal in twenty-four to forty-eight hours.

After repeated animal passage these strains of cocci change into pneumococci, both as regards form and pathogenic power. As virulence increases, clump formation disappears, they no longer adhere to solid media, and only rarely produce endocarditis, but, instead, cause death from bacteriemia or pneumonia. Fatal pneumococcemia without localization was observed eleven times; bronchopneumonia, seven times; and lobar pneumonia, five times. The strains isolated from the animals with pneumonia on further animal passage produced rapidly fatal pneumococcemia and not pneumonia. Pneumonia and endocarditis were observed in the same animals five times. The organisms isolated from the lung and peribronchial lymph glands in each instance resembled typical pneumococci while those from the depths of vegetations resembled closely the endocarditis strains.

Experiments with cultures of cocci isolated from chronic infectious endocarditis mixed with cultures of streptococci,

experiments with mixed aerobic and anaerobic cultures of cocci from the throat and experiments with mixed cultures of *Streptococcus viridans* and the *Bacillus fusiformis*, and with the *Bacillus fusiformis* only, have convinced Rosenow that the conclusion drawn in his earlier papers that the cocci in question are modified and attenuated pneumococci has received additional support because growths from single cocci from strains isolated originally from the blood of cases of endocarditis as well as from throats, when passed through animals, take on cultural and pathogenic properties indistinguishable from those of typical pneumococci. His results also suggest strongly to him that the organisms belonging to this group may cause various forms of endocarditis designated as "simple infective endocarditis" in man as well as the malignant form of chronic infectious endocarditis.

38. **Variations in Content of Serum and Plasma.**—From a practical point of view Gurd's experiments demonstrate that the serum of guinea-pigs, unless they be the subjects of acute infections, may be depended on to contain a constant amount of complementary body available for serum reactions, granted that the blood from which it is procured is preserved in a definitely standardized manner especially in so far as this refers to temperature and time. Conversely, blood kept in haphazard manner cannot be depended on for employment in complement-binding reactions. He found that if, on removal from the body, the blood be placed at 37 C. for a period of from one-half to one hour, and subsequently placed in the ice-chest at a temperature of about 2 C. it may be employed with but little likelihood of experimental error arising therefrom during a period of from twenty-four to forty-eight hours.

39. **Toxic Substance from Pneumococci.**—The toxic substance obtainable from pneumococci Rosenow found to be soluble in ether. It is formed chiefly during retrogressive changes in pneumococci. Heating the clear toxic autolysate to 60 C. for twenty minutes destroys the toxicity, while toxic pneumococcus suspensions remain toxic even after boiling. Hydrochloric acid in weak solution destroys the toxicity of pneumococcus autolysates. The toxic substance is absorbed by blood charcoal from which it can again be obtained by shaking with ether. Autolyzed virulent pneumococci and nonvirulent pneumococci diminish the toxicity slightly while unautolyzed virulent pneumococci increase it. The toxic substance is probably a base which contains amino groups of nitrogen. Indications have been obtained showing that during pneumococcus infections toxic substances are produced which do not call forth any immunizing response.

40. **Rheumatic Myocarditis.**—The experimental production in rabbits of minute, disseminated regions of infection, their close morphologic correspondence to the focal lesions in the human heart in acute articular rheumatism, and the fortunately exceptional characteristics of the changes, which make comparison so easy lead Jackson to the suspicion that they all have a similar etiology. As is well known, the ordinary *Streptococcus pyogenes* produces in man, as well as in rabbits and other animals, minute abscesses with a marked infiltration of polymorphonuclear leukocytes, changes quite different from those forming the subject of this report. Involvement of the joints took place in many of Jackson's patients with epidemic sore throat, from whom the streptococci used to produce these lesions were obtained.

American Journal of Diseases of Children, Chicago

September, IV, No. 3, pp. 129-196

42 *Some Fundamental Principles in Studying Infant Metabolism. F. G. Benedict and F. B. Talbot, Boston.
44 Congenital Obstruction of Posterior Urethra: Report of Case in Boy Aged Five Years. J. H. M. Knox and T. P. Sprunt, Baltimore.
45 Summer Diarrhea; Heat; Humidity. L. T. Royster, Norfolk, Va.
46 *Hypodermic Use of Hematinics in Treatment of Anemia in Children, with Report of Cases. H. Lowenburg, Philadelphia.
47 Pellagra in Children. J. R. Snyder, Birmingham, Ala.

43. **Infant Metabolism.**—Although the results of their investigations on the whole are not yet ready for publication, the authors feel convinced of the importance of considering in all subsequent metabolism experiments the pulse-rate of the infant, and particularly the degree of muscular activity. The enormous variations in the total metabolism as affected by what might otherwise appear to be slight muscular activity, are such as to lead them to question seriously all experiments made in twenty-four periods, and they assert that all metabolism experiments on infants made without known controlled pulse-rates and without graphic records of muscular activity are lessened enormously in value by the absence of these important factors.

46. **Hypodermic Use of Hematinics in Anemia.**—The hypodermic injection of hematinics is said by Lowenburg to be a quick, safe and reliable means of treating the anemias of childhood. A combination of iron and arsenic compounds seems to have a better effect than either alone. Small doses of each give as good results as large ones. The tonic effect is noted almost immediately after beginning treatment. The injections should be made deep in loose tissues.

Journal of Medical Association of Georgia, Augusta

September, II, No. 5, pp. 137-176

48 Injurious Effects of Iodids and Bromids on Acute Inflammations, Especially Cystitis. E. B. Block, Atlanta.
49 Salvarsan in Treatment of Syphilis. E. G. Ballenger and O. F. Elder, Atlanta.
50 Use of Salvarsan. W. L. Champion, Atlanta.
51 Chronic Ulceration of Trigone and Vesical Neck a Sequel of Specific Urethritis. J. L. Farmer, Savannah.
52 *Two-Step Method of Enucleation of Prostate. A. L. Fowler, Atlanta.
53 *Kidney Symptoms and Diagnosis. M. L. Boyd, Atlanta.
54 *Value of Ureteral Catheterization. W. F. Shallenberger, Atlanta.

52, 53 and 54. Abstracted in THE JOURNAL, June 8, pp. 1780 and 1781.

Old Dominion Journal of Medicine and Surgery, Richmond, Va.

September, XV, No. 3, pp. 99-174

55 *Rupture of Liver; Report of a Case. G. B. Johnston, Richmond, Va.
56 Differential Diagnosis Pneumonia and Appendicitis. J. W. Lockhart, Omro, Wis.
57 Medicine in Lay Literature. B. M. Randolph, Washington, D. C.
58 Suppurative Diseases of Kidneys, Including Renal Calculus, Their Symptoms, Diagnosis and Treatment. J. F. Highsmith, Fayetteville, N. C.

55. **Rupture of Liver.**—Two years ago Johnston's patient was thrown from his wagon and the wheels crossed over the body at the level of the seventh, eighth and ninth ribs, at 5 p. m. At 7 p. m. the temperature was 95 F., pulse 62. Abdomen was soft; no complaint of any pain except of the broken ribs. At midnight, temperature was 98.6 F., pulse 80. About 4 a. m. he complained of pain in the abdomen. At 7 a. m. temperature was 101 F., pulse 124. There was great rigidity of the right abdominal muscles, especially of the upper half of the right rectus, and tenderness over the right hypochondrium. No vomiting or nausea. Leukocytes, 14,000 per c.mm. Differential count: polymorphonuclear neutrophils 94 per cent. The urine showed a few blood-cells and casts. A tentative diagnosis of rupture of the large bowel or gall-bladder, with beginning peritonitis was made. A long, free right rectus incision was made from the costal angle to about the line of the umbilicus. On opening peritoneum great quantity of blood in clots and free issued from the wound. The blood was rapidly removed.

Exploration revealed that the liver was ruptured. The incision was then extended by cutting through the fibers of the right rectus. The broken ribs lent great aid in exposing an enormous rent in the right lobe of the liver. This rent began with a Y-shape on the convex surface of the liver at its highest point, passed forward and mesially over the free border of the liver about one inch to the right of the gall bladder, and on to the under side of the liver as far as the junction of the cystic duct with the hepatic duct. The gall-bladder was collapsed, but there was no rent in it nor in any of its ducts. There was no free bile discoverable in the abdominal cavity, nor was there any other intra-abdominal injury. A blunt liver needle threaded with No. 4 catgut was passed deeply through liver tissue. Six or eight interrupted sutures from three-quarters to one inch apart were introduced to close the rent in the convex surface. The liver was then turned up, and starting at the rear extremity of the wound on the concave surface three or four interrupted

sutures closed the wound to the free border. With the tying of the sutures hemorrhage was immediately stopped. The cavity was rapidly cleansed with wet saline sponges, a small cigarette drain was introduced into the right kidney pouch, a light drain was laid over the line of sutures and all brought out at the upper end of the incision. Rapidly placed through and through sutures closed the abdominal wound. The patient left the table in a desperate condition. Shock was extreme; pulse was 160 and barely perceptible. Subcutaneous saline, which had been started before the operation, continued through it, was kept up after the patient was put to bed. The extremities were bandaged and general treatment for shock instituted.

Patient reacted from the shock. Removal of the drainage commenced about eight days after operation. Bile made its appearance through the wound, but disappeared a few days after drainage was removed. Discharged six weeks after operation, wound entirely healed, and is at this time in perfect health.

Journal of South Carolina Medical Association, Seneca

September, VIII, No. 9, pp. 242-261

59 Intussusception of Ileum in Infants and Children. J. S. Horsley, Richmond.
60 Pellagra: Report of Case. R. T. Ferguson, Gaffney.
61 Complete Prolapse of Uterus, Complicated with Pregnancy. J. C. Harris, Anderson.
62 Examination of Nervous Patient. H. Crenshaw, Atlanta, Ga.

Journal of Cutaneous Diseases, New York

September, XXX, No. 9, pp. 515-586

63 Dermatitis Pustulosa Vegetans Recurrens. G. Pernet, London, England.
64 *Trichloracetic Acid as Keratolytic in Seborrheic Keratosis. D. W. Montgomery and G. D. Culver, San Francisco.
65 Single-Dose Roentgen-Ray Method. G. M. MacKee and J. Remer, New York.

64. **Trichloracetic Acid.**—Trichloracetic acid was found by the authors to act particularly well on epithelial structures and to be an excellent keratolytic, especially in seborrheic keratosis. It is, furthermore, their opinion that its good effect on these lesions is in some way connected with its behavior toward fat. Seborrheic keratosis is undoubtedly a fatty degeneration and is intimately connected with seborrhea of the general cutaneous surface. It is not strange that trichloracetic acid should have a selective action on fatty epithelium, as its near neighbor, glacial acetic acid, has a strong keratolytic action that has been for long used both by physicians and by the manufacturers of proprietary cures in the treatment of corns. Glacial acetic acid, although it acts powerfully on the surface both as a rubifacient and as a dolorific, is, however, far from having the profound cauterizing effect of trichloracetic acid.

New York Medical Journal

September 28, XCVI, No. 13, pp. 617-668

66 Dental Hygiene for Pupils of Public Schools. S. A. Knopf, New York.
67 Putrefactive Products of Intestinal Tract as an Etiologic Factor in Chronic Disturbances. C. C. Sutter, Rochester, N. Y.
68 Sanitary Control of Prostitution in Some European Cities. F. Bierhoff, New York.
69 Care of Mentally Disturbed, Not Permanently Insane. T. A. Williams, Washington, D. C.
70 *Microscopic Findings in Twenty-Four Cases of Malarial Hemoglobinuria. A. Woldert, Tyler, Texas.
71 Treatment of Acute Staphyloma of Cornea. P. J. Pontius, Philadelphia.
72 Ten Sex Talks to Girls. I. D. Steinhardt, New York.
73 Vaginal Cesarean Section Post Mortem. A. T. Hawes, Lynn, Mass.
74 Two Forms of Acute Intestinal Obstruction Within Five Months in an Infant One Year Old; Two Laparotomies; Appendectomy; Recovery. L. Neuwelt, New York.

70. **Microscopy in Malarial Hemoglobinuria.**—In this series (twenty-four) of cases of blackwater fever, the urine was examined by Woldert in seventeen cases. Observation of the whole series proved that at the onset of the paroxysm of hemoglobinuria the urine within a few hours changed from the normal color to a dark red or port wine color, due to the contained hemoglobin. This red or port wine color, did not in a single instance depend on the presence of red blood-corpuscles. Not one of the cases in the entire series of seventeen examined, could be properly classed as one of hematuria. In eight out of the seventeen cases examined, Woldert found that red blood-corpuscles were entirely absent in the urine. In seven cases, and two doubtful instances in which red blood-corpuscles were found, they were never present in sufficient quantity to give a red color to the urine. Free hemorrhage from the kidneys never occurred in any of the series of cases. In all instances the reaction for blood coloring matter was obtained in the urine, when examined for. The very large amount of albumin present in the urine, and the great amount of destroyed hemoglobin also present, Woldert says, indicates a high grade of dyscrasia. The suddenness with which the hemoglobin appears in the urine after a shaking chill, indicates that the excretion of blood coloring matter begins almost immediately after it has been thrown out of solution.

In most instances the urine was devoid of odor when first excreted, and seemed to require a longer time to undergo decomposition than normal urine. The reaction of the urine was in nearly every instance acid. Neither glucose nor indican were ever present. Woldert has never found bile present in the urine in malarial hemoglobinuria, unless he had good reasons for believing that it had been contaminated with vomitus, which, in these cases, is often composed largely of bile.

In some instances the amount of albumin and blood coloring matter present after boiling amounted to 50 per cent. of the entire bulk of the urine. The relation of uric acid to urea in cases of malarial hemoglobinuria apparently varies considerably. In one of my cases the relation was one part uric acid to ten of urea; while in another case the relation was one part uric acid to sixty-three of urea. In some specimens of urine, he repeatedly found certain round and concentrically arranged bodies, from 10 to 40 microns in diameter, often containing a darker brown dot or apparent nucleus. These bodies were composed of uric acid. Woldert frequently found bright, red crystals of hematoidin. He never found any special type of microorganism prevailing in the urine.

In several instances he found that disintegrated blood coloring matter (or destroyed hemoglobin), while under the cover slip, would arrange itself in the shape of tube casts. Of the seventeen cases in which the urine was examined, he found hyaline and granular casts, as ordinarily met with in nephritis, present in seven cases, and absent in ten cases. In nine cases out of the seventeen, he found bodies resembling tube casts, made up of disintegrated blood coloring matter. Woldert has never found in any instance evidence that nephritis developed as a sequela of hemoglobinuria. During the paroxysm of hemoglobinuria, nephritis unquestionably occurs in many cases.

Boston Medical and Surgical Journal

September 26, CLXVII, No. 13, pp. 419-454

75 Filterable Viruses, a Summary. S. B. Wolbach, Boston.
76 Subphrenic Abscess. A. C. Heffenger, Portsmouth, N. H.
77 Acapnia: Its Surgical Importance. F. J. Cotton, Boston.
78 Case of Pellagra That Had Not Been Outside of New England for Eighteen Years. R. I. Lee, Boston.

Journal-Lancet, Minneapolis

September 15, XXXII, No. 18, pp. 479-506

79 Transactions of Minnesota State Medical Association, Forty-Fourth Annual Meeting, 1912.

Journal of Indiana State Medical Association, Fort Wayne

September 15, V, No. 9, pp. 367-418

80 Gunshot-Wound of Stomach, Liver and Left Branch of Portal Vein; Recovery. J. V. Reed, Indianapolis.
81 Malignant Neoplasms of Accessory Sinuses. A. E. Bulson, Fort Wayne.

Medical Record, New York

September 28, LXXXII, No. 13, pp. 553-598

82 Unjustified Prejudice of Tuberculous Patients Against Sanatoria and Hospitals. S. A. Knopf, New York.
83 *Vaccines in Suppurative Otitis Media. A. C. Christie, U. S. Army.
84 Gall-Stones. H. Dewolf, Watkins, N. Y.
85 Vesical Calculi. L. Sexton, New Orleans, La.
86 Intestinal Obstruction, with Report of Cases. C. P. Farnsworth, Chamberlain, S. Dak.
87 Relation of Diet to Heart and Blood-Vessel Disease. L. F. Bishop, New York.

83. **Vaccines in Suppurative Otitis Media.**—According to Christie the use of vaccine treatment in acute suppurative otitis media should be confined to those cases which are resistant to local treatment, and then it should be used in addition to, and not to the exclusion of, such treatment. In

addition to these acute cases it is the general opinion of men who have used them that vaccines are of value in most subacute cases. In chronic cases their field of usefulness is much more restricted, depending probably on two factors, the amount of necrosis and the condition of the circulation in the mastoid. Enough cases have been reported by different observers to show that vaccines are an aid to the treatment of chronic cases even of long standing, but the more chronic the disease becomes the more is it likely that operative measures will be necessary to effect a cure.

Lancet-Clinic, Cincinnati

September 14, CVIII, No. 11, pp. 267-294

88 Tuberculin Dosage. L. B. Morse, Hendersonville, N. C.
89 Prognostic Significance of Albuminuria and Casts. C. N. McCloud, St. Paul.
90 Methods of Urinalysis Applicable to Insurance Examinations. S. H. Baxter, Minneapolis.
91 The Medical Society. W. Scott, Loveland, Ohio.

September 21, CVIII, No. 12, pp. 295-322

92 Medical Examiners from Standpoint of Medical Director. O. H. Rogers, New York.
93 Selection and Training of Medical Examiner. E. A. Babler, St. Louis.

Journal of Abnormal Psychology, Boston

August, VII, No. 3, pp. 161-232

94 Interpretation of "Professional-Cramp-Neurosis" as a Tic. T. A. Williams, Washington, D. C.
95 Hypnagogic Hallucination with Dream Characters. C. S. Yoakum, Galveston, Texas.
96 Edipus-Complex in Psychoneuroses. I. H. Coriat, Boston.
97 Anal Eroticism and Character. A. A. Brill, New York.
98 Versuchung Angst Attended by Visual Hallucinations of a Homicidal Nature. G. A. Young, Omaha, Neb.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

British Medical Journal, London

September 14, II, No. 2698, pp. 589-668

1 Nature, Origin and Maintenance of Life. E. A. Schäfer.
2 Influence of Muscular Exercise and Open Air on Bodily Functions. L. Hill.
3 *Intravenous Infusion Anesthesia. F. Rood.
4 Examination of Patients by Anesthetists. A. Wilson.
5 Comparison of Methods Employed for Inducing Anesthesia and Analgesia, Respectively. C. A. Leedham-Green, A. Ehrenfried and R. E. Kelly.
6 Use of Alkaloidal Bodies Prior to Inhalation. F. W. Bailey.
7 *Effect of Chloroform and Ether on Liver and Kidneys in Health and Its Significance in Certain Infective Conditions. R. E. Apperly.
8 *Cardiac Effect of Epinephrin in Chloroformed Subjects. A. G. Levy.

3. **Intravenous Infusion Anesthesia.**—Rood thinks it probable that this method of anesthesia will soon take its place as one of the recognized methods of inducing surgical anesthesia.

7. **Effects of Chloroform and Ether on Kidneys.**—The experimental work done by Apperly had for its object the determination of the extent and nature of the injury done to the cells of the liver and kidneys, by an acute infection, by chloroform and ether, the significance of a combination of the two, and finally a short series of experiments were done with the object of showing the value of glucose in combating the symptoms caused by such agents. After the first series of animals, experiments with ether were discontinued, as the results obtained were almost negative and merely bore out work which had already been very fully done. He found that chloroform has not only a profound effect on the cells of the liver, a fact which has frequently been shown, but that it has an almost equally harmful effect on the cells lining the tubules of the kidney, a fact which, he says, has never been sufficiently emphasized. The damage done to the kidney seems of even greater import than that done to the liver. For the chloroform not only acts on the liver cells and interferes with the metabolism of fats, thereby throwing out into the blood the poisonous fatty acids which cause an acid intoxication, but by its injury to the kidney cells interferes very seriously with their chief means of excretion. Ether, even in very large doses, does not have this harmful action on the cells of the liver and kidney to anything like the same extent.

The fact that the damage done in those animals which had subcutaneous injections was much greater than in those which had inhalations would seem to indicate that the higher the percentage of chloroform in the blood the greater its harmful effects, so that a few minutes very deep anesthesia may do more damage than an hour's light anesthesia, emphasizing the importance to the anesthetist of giving the minimum dose of chloroform to his patient consistent with the requirements of the surgeon. In view of the fact that acute infections, at any rate of the peritoneum, do cause definite degeneration changes in the liver, and changes, though less marked, in the kidney, Apperly says, it seems of importance that in cases of this kind chloroform should not be given unless absolutely necessary, on account of its harmful effects on the same organs, and that ether, which has not the same harmful action, should be used whenever possible.

8. **Cardiac Effect of Epinephrin in Chloroformed Subjects.**—In the course of some investigations on the heart beat in animals under chloroform Levy found that epinephrin exerts a very pronounced cardiac effect, and one that has an important clinical significance. Within a few seconds of the injection of 5 minims of the 1 in 1,000 solution, the pulse accelerates with a raised tension; it becomes more rapid, is less readily felt owing to diminished excursion, and it may or may not be perceptibly irregular at the wrist; a few temporary pauses may be noted, and then the heart suddenly ceases beating; the pupils dilate widely, and intense pallor supervenes. Respiratory phenomena then follow, a few deep breaths being taken, and then the respirations cease also. A few spasmodic efforts at respiration may be made, or even a short term of regular breathing may be induced by artificial respiration, but the heart still remains impotent. The heart may, however, recover temporarily, still with a small and rapid beat, only to fail once more, and in this way the pulse may be briefly felt after the respiratory collapse has occurred. If the cardiac recovery is well sustained the respiration is restored also, only to fail again with the second collapse of the heart. In more favorable cases the heart eventually becomes regular, the breathing is restored permanently, and all goes well. The conclusion drawn by Levy is that it is unsafe to inject epinephrin into the veins or vascular tissues of a patient lightly under the influence of chloroform. It may be safely injected just previous to induction with chloroform, that is, with the patient under no anesthetic at the moment, or into a patient fully under chloroform, or into a patient anesthetized to any degree with ether. Whatever the dose and whatever the dilution, and, in fact, whatever the other attendant conditions may be, in the case of light chloroform anesthesia a risk is always taken which is unjustifiable.

Lancet, London

September 14, II, No. 4646, pp. 743-806

9 Eye Symptoms and Early Diagnosis of Diseases of Nervous System. J. Hinshelwood.
10 Septicemia With Local Endocardial Lesion: Report of Nine Cases. J. Henderson.
11 Carcinoma and Sarcoma of Same Breast. E. H. Kettle.
12 Two Cases of Acute Pancreatitis; Abdominal Drainage; Apendicostomy; Recovery. W. Billington and B. G. Goodwin.
13 *Chronic Edema of One Leg in a Child. E. O. Hughes.
14 Prophylactic Use of Roentgen-Rays Before and After Operation for Malignant Disease. R. Knox.
15 Care of Consumptives. T. G. Lyon.
16 Subcutaneous Rupture of Kidney; Intraperitoneal Hemorrhage; Expectant Treatment; Recovery. E. G. Stanley.

13. **Chronic Edema of Leg.**—Hughes' patient, a girl, aged 6 years, had always been in good health except for a slight attack of measles some years before. Examination showed a fairly soft edema of the left foot, ankle and leg about half way up to the knee which was first noted a week before. There was no evidence of inflammation of any of the structures of the limb, and no sign of venous obstruction there. Deep palpation of the abdomen, which could be easily made, showed nothing abnormal. Further examination showed no clinical sign of disease in the circulatory system or elsewhere. The temperature was normal; the blood-pressure 90 mm. She was ordered a mild iron mixture and rest in bed. The continued absence, however, of any discomfort in the leg made this inaction hard to maintain. The edema, which diminished slightly during rest, increased when the leg

was set down, and rather quickly extended until in a month from the commencement it involved the entire limb, which measured 2½ inches more than its fellow. Four isolated specimens of urine taken at this time showed a density of 1.020 to 1.028, and a uniform trace of albumin; the early morning urine showed an equal trace. There were no casts and no bacteria. Two day specimens, slightly later, showed no albumin. The child has been allowed to attend school, and runs about with an elastic-web bandage applied to the leg. She gives a negative von Pirquet reaction. A short experimental course of thyroid and a longer one of calcium lactate have been ineffectual. The edema is rather firm and pits on pressure; and that part of the abdominal wall corresponding to the area drained by the left superficial epigastric vein is perceptibly bulkier than the same area on the opposite side. The surface of the left leg has less warmth than the other, and to the unaided senses the quality of the skin appears to be unchanged.

Annals of Tropical Medicine and Parasitology, Liverpool

September 12, VI, No. 3, pp. 301-325

17 Trypanosomes Infecting Game and Domestic Stock in Luangwa Valley, Northeastern Rhodesia. A. Kinghorn and W. Yorke.
18 Trypanosomes Obtained by Feeding Wild Glossina Morsitans to Monkeys in Luangwa Valley, Northern Rhodesia. A. Kinghorn and W. Yorke.

Journal of Obstetrics and Gynecology of British Empire, London

August, XXII, No. 2, pp. 65-118

19 *Investigation of Coliform Organisms in Healthy and in Infected Urinary Tract of Female, with Report of Patients Treated with Autogenous Vaccines. R. S. Williams, H. L. Murray and A. J. Wallace.
20 One Hundred Cases of Retrodisplacement of Uterus Treated by Gilliam Method of Round Ligament Suspension. W. D. Macfarlane.
21 Melanotic Sarcoma Clitoridis. F. A. L. Lockhart.
22 Fibromyomata of Uterus Complicating Pregnancy. J. N. Stark.
23 Chronic Ovarian Pain as Illustrated in Patient Finally Treated by Double Oöphorectomy. A. W. Russell.
24 Pelvic Hematocele Associated with Intrauterine Pregnancy. W. D. Macfarlane.

19. **Coliform Organisms in Urine.**—Typical *B. coli* (MacConkey) were found by the authors in a considerable percentage of female urines taken under conditions precluding all source of contamination. Although cases culturally identical, agglutination reactions proved that there are wide biologic differences between the various strains isolated. As male urines very rarely show the presence of this organism, it is reasonable to suppose that the usual path of entry is by way of the perineum and urethra. When infection of the urinary tract is present the coliform organisms isolated show great variation in cultural reactions. Vaccines therefore should be autogenous, and since the same case may show the presence of more than one organism, vaccines should be prepared from many colonies. Vaccine treatment of coliform infections is of pronounced benefit. In acute cases, if due care be taken and the doses and intervals carefully regulated, a very marked improvement can be very speedily produced in the vast majority of cases; but, to obtain this, very close supervision is necessary. A first dose in acute cases should never exceed ten millions, the intervals must be short and, if there be any doubt, opsonic indices should be taken. Subacute or chronic inflammations are equally hopeful, provided that the doses are suitably increased, that it is appreciated that the treatment should be coterminous with the presence of pus in the urine, and that this may be a somewhat lengthy process. Cure does not necessarily imply the sterilization of the urine.

Edinburgh Medical Journal

September, IX, No. 3, pp. 193-288

25 Orthoradiography of Heart and Aorta. W. H. Fowler and W. T. Ritchie.
26 Enucleation of Faucial Tonsil with the Guillotine. J. K. M. Dickie.
27 Mesothorium, Thorium X and Thorium Emanation and Their Therapeutic Use. D. Turner.
28 Two Cases of Separate Acromion Process, with Appearances Presented in Radiographs of Acromion Process and Upper End of Humerus During Ossification. J. W. Struthers.
29 Intussusception in Children; 400 Cases. A. Koch and H. P. T. Oerum.
30 The Insurance Act. A. S. Pringle.
31 Insanity Associated with Chloral-Bromid Poisoning and Brain Abscess. A. W. Neill and W. Muirhead.

Glasgow Medical Journal

September, LXXVIII, No. 3, pp. 161-239

32 Four Cases of Fracture of Larynx. W. Downie.
33 Case of Elephantiasis Occurring in Scotland. W. K. Hunter.
34 *Case of Contusional Pneumonia. J. W. Mathie.
35 *Insertion of Rectus Abdominis Muscle. A. B. Aitken.
36 Some Aspects of Medical Life in Old Glasgow. H. A. McLean.

34. **Contusional Pneumonia.**—Mathie's patient, a man, aged about 45 years, while cleaning the inside of a church window, fell, coming down on the top edge of a pew, and striking the left side in the region of the lower ribs. He was stunned by the accident and had to lie on one of the seats for about half an hour. Then, feeling better, he resumed work, but in a very short time had to cease and make his way home, which he did with difficulty. The accident took place about the middle of the day. Mathie did not see him till late at night, when he found him with a temperature of 103.6 F., and complaining of severe pain just where he struck, viz., over the lower ribs in the midaxillary line on the left side. There were no signs of bruising, or of fractured rib; of the latter fact one could be certain, on account of the fact that the patient was such a thin man that each rib could be followed along its length quite easily. Next morning his temperature was 101.6 F., and there was cough and colorless sputum, but no definite signs of lung implication. On the third day there was distinct tubular breathing and slight dulness over the back of the left lower lobe, and this became more marked on the succeeding days. The temperature kept about 102 F.; cough and pain continued, but were moderate in severity. On the sixth day of illness his temperature in the evening dropped to normal and the pulmonary signs soon cleared up. Examination of his urine shortly after the commencement of the illness revealed a large quantity of albumin.

On two or three occasions during the acute part of the illness, and twice in the week following the crisis, the patient passed some blood by the bowel, sometimes black and clotted, at other times red and more liquid. The source of this was not quite evident. The patient had had pneumonia twice previously.

35. **Insertion of Rectus Abdominis Muscle.**—Aitken examined fifty subjects to determine that the rectus abdominis has an attachment to the linea alba. He says that if, in exposing the posterior wall of the rectus sheath during the course of a median adbumbilical laparotomy, the inner border of the muscle is raised by slipping under it a director and running the instrument from below upward, the muscle is left with a ragged edge, and the instrument tends at times to slip aside into the substance of the muscle. This does not occur if separation is effected from above downward, and suggests a definite attachment of the muscle to the linea alba. Certain of the inner fibers of the muscle fail to extend down as far as the symphysis pubis, but pass obliquely inward, and are attached to the linea alba by a series of little tendinous fasciculi, similar to those found at the insertion of the pyramidalis. Occasionally these tendons are not evident, and the muscle fasciculi appear to end directly in the fibrous tissue of the middle line. The upper limit of the insertion varies very considerably, but is usually from 2½ to 3 inches above the symphysis pubis. In none of the subjects examined did it extend above the inner extremity of the fold of Douglas, and it frequently fell short of this by 1 and 1½ inches, i. e., the attachment exists only where the posterior wall of the sheath is deficient or absent.

British Journal of Children's Diseases, London

September, IX, No. 105, pp. 385-432

37 Idiocy and Congenital Syphilis. H. R. Dean.
38 Prevention of Deafness in Children. M. Yearsley.
39 Massage in Wasting Diseases of Children. J. M. MacPhail.

Practitioner, London

September, LXXXIX, No. 3, pp. 301-444

40 Use of Pessaries. G. E. Herman.
41 Treatment of Eclampsia. G. B. Smith.
42 *Puerperal Infection. H. L. Murray.
43 Literature on Public Health. J. Priestley.
44 *Pruritus and Other Itching Diseases of the Skin. J. L. Bunch.
45 Vaccine Treatment of Acne and Allied Conditions. T. Galbraith.
46 Vaccine Treatment of Seborrhea. A. F. Savill.

47 Enucleation of Tonsil. L. Sewell.
48 Fungi: Thermal Mud and Peat Baths. T. D. Luke.
49 *Blood in Cancer; Treatment. S. Keith and G. E. Keith.
50 Practical Value of Opsonic Estimations. J. S. Dick.
51 Disease as Nemesis of Reproductive Inefficiency. A. J. Brock.

42. **Puerperal Infection.**—To administer an antistreptococcus serum in every case of puerperal infection is considered the proper treatment by Murray and he urges that this should be given early, and in large quantity. Not that it is all that could be wished, far from it; but the tendency to give it as a last resort, when the patient is obviously going to the bad, is deeply rooted and bound to react unfavorably on our idea of its utility. At worst, it is harmless; at best, it may be of distinct service. Streptococci will grow freely in a strong antistreptococcus serum, provided this is stale, and this, of course, is the condition in which one purchases it. The key which unlocks the bacteriolytic action is only found in fresh serum, and is known as the complement; therefore, when we give a bacteriolytic serum we rely on the patient to provide this fresh element. But, unfortunately, this reliance may be, at times, somewhat misplaced; because, first, the amount of complement in human serum varies very greatly, and is liable to become more or less exhausted, in acute infections; and, second, there is some experimental evidence that human complement is less efficient for horse anti-serum than horse complement.

The ideal way, therefore, to administer antistreptococcus serum is to give it with fresh horse serum. Such a serum, then, should be given early in every case, in which there is the least reason to regard local treatment as proving insufficient, and in good quantity, 10 c.c., repeated in twelve hours. If there is no improvement the brand of serum for the next administration should be changed, and, if necessary, a third tried. The patient is thereby given a better chance of receiving a serum more directly specific for her particular case. Encouraging results are gradually forthcoming in cases in which the patient's own organism has been used, especially when the patient herself is making a fair fight; that is to say, in cases in which the course tends to be somewhat subacute. Stock vaccines must never be given in acute infections. A vaccine is a powerful poison, and the repeated addition to the intoxication present, which is what the administration of a vaccine represents, can only be justifiable if a reaction, directly bearing on that intoxication, can be promised. The immediate and constant supervision by one accustomed to direct such treatment must be available in every case; even with the opsonic index, the regulation of the dosage is sufficiently difficult in acute illness.

Rational local treatment is not held by Murray to be contra-indicated by the presence of a generalized infection. In a case in which the patient is reacting to the infection, a certain amount of antibody is produced; improvement will depend on whether this amuont is more than sufficient to compensate for the constant multiplication of the organisms. When a vaccine is given, it is with the idea of stimulating more fully the production of antibody by something which does not itself multiply; a relative advantage of antibody over organisms will thus be produced. A cureting is not to be countenanced, the risk of increasing channels of infection being out of proportion to the advantage of removing some of the infected material.

44. **Pruritus and Itching Diseases.**—A lotion which has given Bunch good results is the following:

℞	Gm. or C.c.		
Phenolis	4		ʒi
Glycerini	8	or	ʒij
Liq. picis carbonis	30		ʒi
Aquam	ad 240		ʒviij

The following mixture is also recommended:

℞	Gm. or C.c.		
Chloralis hydratis	4		ʒi
Camphoræ	4	or	ʒi
Spt. coloniensis	30		ʒi
Aquam	ad 240		ʒviij

If there are many abrasions, it is better to use a weak solution of cocain or eucain in combination with liq. plumbi subacetatis. A paint of methylene-blue, 4 grains to the ounce, is sometimes successful, combined with pills containing one grain given night and morning, and although it turns the urine blue, this does not matter if it does not contain sugar. In localized pruritus, ointments, sprays, paints and varnishes have a much larger field of usefulness than in generalized pruritus, and these are usually made up with cocain, chloroform, aconitin or carbolic acid. When a localized pruritus proves resistant to such external applications, a rapid application of the actual cautery to the most irritating areas often causes great amelioration of the symptoms.

The high-frequency current applied with a glass electrode is occasionally successful; and ionization with thorium nitrate solution has given good results. But if it is desired to employ radio-active methods of treatment, it is, in Bunch's experience, much better to apply radium itself, especially if the area to be treated is small. For larger surfaces, ultra-violet rays or Roentgen rays sometimes act like a charm, and he has seen cases which resisted all other treatment cured, at least for a time, by such means. Excision of the affected area, if small, may occasionally be necessary, but division of the afferent cutaneous nerves, although sometimes practiced by surgeons, rarely commends itself on account of the resulting anesthesia and atrophy of the area involved, as well as other possible unfortunate sequelae.

49. **Blood in Cancer.**—The authors are still of the opinion that death from cancer, when there is no complication, is due to the poverty and destruction of the red cells, and to the actual and relative increase of the polymorphonuclears at the expense of the life-giving lymphocytes. Therefore, they believe that it is advisable not only to bring the blood to normal, even to increase the number of lymphocytes until they are in excess of the normal, but this lymphocytosis must not be carried too far.

Annales de l'Institut Pasteur, Paris

July, XXVI, No. 7, pp. 497-576

52 Tuberculosis in the French Colonies. (Enquête sur l'épidémiologie de la tuberculose dans les colonies françaises.) A. Calmette.
53 Study of the Aspergillus Niger. (Action combinée du manganèse et du zinc sur le développement et la composition minérale de l'aspergillus niger.) G. Bertrand and M. Javillier. (Recherches sur la sucrase de l'aspergillus niger.) G. Grezes.
54 Comparative Action on Albumin of the Putrefaction Microbes. (Action comparée des microbes de la putréfaction sur les principales albumines.) H. Tissier.
55 Virulence for Rabbits and Guinea-Pigs of Human and Animal Pneumococci. (Etudes sur le pneumocoque. V.) C. Truche and L. Cotoni.
56 Spirochetes Found in the Mouth. (Microbes spiralés de la bouche.) G. Repaci.

August, No. 8, pp. 577-655

57 *Anatomy of Normal Old Age. (Etude anatomo-pathologique de la vieillesse.) A. T. Salimbeni and L. Géry.
58 *Sugar-Producing Intestinal Bacteria; the Glycobacters. (Recherches sur les microbes amylolytiques de l'intestin.) E. Sollman.
59 The Schmorl Necrosis Bacillus. (Etudes sur le bacille de Schmorl. I.) E. Césari and V. Alleaux.
60 Cultivation of Anaerobes in Fluid Media. (Modifications à l'appareil vide-hydrogène pour les cultures anaérobies en milieux liquides.) R. Legroux.
61 History of Small-Pox in Sweden. (Mortalité par la variole en Suède de 1776 à 1875.) A. Pettersson.

57. **Pathologic Anatomy of Old Age.**—Salimbeni and Géry give a detailed study of the pathologic anatomic findings in the cadaver of a woman of 93 as a standard of physiologic old age. The assumption of auto-intoxication from poisons generated in the digestive tract explains only part of the tissue changes. This probably is responsible for the macrophagic infiltration and sclerosis and a number of cellular lesions in the brain. The parts most directly in contact with the blood are the ones that suffer from the digestive poisons. It is evident that still other factors must be incriminated in the changes of old age, among them ascending auto-infection in the origin of lesions in the pancreas, liver and salivary glands. Another factor is the infinite series of small infections or intoxications from without, each destroying some patch of parenchyma; this is particularly evident in the kidneys. The wearing out of the cells from long use is manifest in the acidophile changes in the liver, pancreas and hypophysis. This wearing out is especially evident in the lungs; no sclerosis nor trace of inflammatory reaction was found in the lungs. No

cause is known to date for the progressive slowing up of cell reproduction everywhere except in the nails and hair and in malignant neoplasms. The hypoplasia which results is most marked in the organs which furnish the largest quantity of cells to the organism, namely, the lymphoid organs and the bone marrow. The distinction between old age and senility is strongly marked. When the causes inducing senility: auto-intoxication, auto-infection, hetero-infection, hetero-intoxication, have been multiple, senile lesions will develop early and intensely and the individual will succumb before reaching an advanced age.

58. **Sugar-Producing Microbes in the Intestines.**—Wollman and Metchnikoff apply the term proteolytic glycobacter and peptolytic glycobacter to the two types of microbes which transform starch into sugar in the intestines—the amylolytic microbes. They have never succeeded in isolating these microbes from man. Those described here were obtained from the ileum of a macacus monkey or from the dog. The action claimed for the glycobacter introduced to combat putrefaction in the intestines was mentioned in THE JOURNAL, September 7, p. 815. This bacillus is expected to transform the contents of the intestines and thus aid in warding off senescence.

Annales de Médecine et Chirurgie Infantiles, Paris

August 1, XVI, No. 15, pp. 449-480

62 Diarrhea in Infants. (De la diarrhée des nourrissons.) A. Rémy.
63 Curvature of the Spine of School Origin. (Déviation de la colonne vertébrale d'origine scolaire.) P. Redara.
64 Physical Training in the Lower Grades. (L'éducation physique à l'école primaire.) L. Dufestel.

August 15, No. 16, pp. 481-512

65 Inherited Taints and Craniotabes. (Craniotabes et hérédo-syphilis.) C. Leroux and Labbé.
66 Meningeal Symptoms of Unknown Origin or Following Zona. M. Eschbach.

Archives des Maladies de l'App. Digestif, Paris

July, VI, No. 7, pp. 359-420

67 *Immediate and Ultimate Results of Operative Treatment of Gastric and Duodenal Ulcer. P. Caillé, G. Durand and L. Marre.
68 *Bronzed Diabetes. (Le diabète bronzé.) M. Labbé.

67. **Operative Treatment of Gastric and Duodenal Ulcers.**—Recent reexamination of forty-five out of 150 patients given operative treatment for ulcer in the stomach or duodenum showed that the ultimate outcome depended mostly on the age of the ulcer or duration of the stenosis of the pylorus, particularly the latter. When the ulcer or stenosis were of recent development at the time of the operation, the gastro-enterostomy cured permanently all disturbances. The pylorus was found permeable in many cases, the natural and the artificial outlet both functioning. This was noted among patients both with and without disturbance later. The ultimate outcome was gratifying in over two-thirds of all the patients. Few seemed to have failed to benefit by the operation. In the other cases of only mediocre results, the lack of care in the diet and excesses of various kinds evidently had conspired to annul the benefit derived.

68. **Bronzed Diabetes.**—Labbé reports a case which he says is the fifty-first on record. The patient was a previously healthy woman who began to suffer from intense thirst and during the following months gradually grew weaker and lost flesh, while sugar appeared in the urine. The glycosuria subsided on dieting at first, but later persisted unmodified, with other symptoms of diabetes and bronzing. The necropsy findings confirmed the assumption of diabetes from cirrhosis of the liver and pancreas plus the pigmentation. The disease seems to have originated in some toxic process of unknown origin. The blood-destroying and sclerosis-producing action of this process caused in turn on the one hand a hemolytic jaundice followed by hemosiderosis, and, on the other hand, cirrhosis of liver and pancreas. These lesions became clinically manifest in the pigmentation and the diabetes.

Archives Mensuelles d'Obstétrique et de Gynécologie, Paris

August, I, No. 8, pp. 49-96

69 *Abdominal Cesarean Section for Premature Separation of Placenta at Normal Site. (Pathologie et traitement du décollement prématuré du placenta normalement inséré.) S. Berggren.

69. **Premature Separation of Placenta at Normal Site.**—Berggren's patient was saved from her precarious situation by prompt abdominal cesarean section and removal of the uterine adnexa. It was not deemed necessary to do a Porro operation in this case. He analyzes a number of similar cases on record; in four the muscular wall of the uterus showed inflammatory lesions probably responsible for the anomaly; in eight other cases there was extensive hemorrhage in the uterus wall; albuminuria had been noted in four of the cases. The premature separation occurs generally in women who have already borne children. The experiences to date with operative treatment are reviewed. In Berggren's case the uterus contracted at once after extraction of the fetus, arresting the hemorrhage.

Journal de Chirurgie, Paris

May, VIII, No. 5, pp. 569-604

70 Technic and Results of Operative Correction of Claw Contracture of the Fingers; Two Cases. (La maladie de Volkmann.) J. Berger.

June, No. 6, pp. 605-776

71 *Solitary Non-Parasitic Cysts in the Long Bones. P. Lecène and C. Lenormant.

July, IX, No. 1, pp. 1-124

72 *Technic for Total Laryngectomy. J. Rouget.

71. **Solitary Cysts in Long Bones.**—A case of a large single cyst in the upper humerus is reported with skiagrams before and after treatment. Eleven other cases from the literature are reviewed and the suggestion made that these solitary cysts are probably more common than is generally supposed. The patients are generally previously healthy children or youths, free from rachitis, who begin to complain of vague pains in the humerus, femur or tibia, or possibly a bone in the hand or foot; sometimes there may have been a preceding local trauma. The pains may be sharp and tenacious or dull and mild, but keeping up for weeks and months. There are never at any time local signs of inflammation or a febrile reaction. The general health is not impaired. The swelling of the bone is generally of a regular ovoid or spindle shape; the soft parts do not adhere to the bone, and there is no enlargement of neighboring lymph-nodes. The enlarged bone is little if at all tender unless the seat of a recent traumatism. In some cases the bone had fractured without any signs of trouble having been noticed. Radioscopy differentiates the cyst at once. The rapid repair of the bone after evacuation of the cyst is most striking; even in case of fracture, healing is soon complete as soon as the cyst is emptied. It has no actual lining membrane, and seems to belong to the group of dystrophy of the bones peculiar to the young, having nothing in common with neoplasms or albuminous ostitis. In the case reported the cavity was plugged with the Mosetig-Moorhof iodoform paste filling and the arm was placed in a sling. The wound was not dressed for two weeks, when it was found entirely healed.

72. **Technic for Total Laryngectomy.**—Rouget's article has thirteen illustrations, three giving the details of the artificial larynx apparatus which he thinks is the best offered to date. He reviews the satisfactory results obtained with it; one patient operated on in 1904 can make himself understood even over the long-distance telephone.

Journal de Médecine de Bordeaux

June 30, XLII, No. 26, pp. 405-420

73 *Young Woman with Three Legs. (De la pygomélie chez l'homme.) A. Baudrimont. Commenced in No. 24.

July 7, No. 27, pp. 421-436

74 *Technic for Removing Very Large Goiter. (Intervention chirurgicale pour un énorme goitre colloïde.) J. Laconture and A. Charrier.

August 4, No. 31, pp. 485-500

75 Brain Tumors; Two Cases. (Tumeurs des centres nerveux.) E. Bilot and F. Papin.

73. **Pygomelus.**—Baudrimont gives the detailed history with photographs and necropsy findings in the case of a young woman with three legs and the stump of a fourth, who had long been exhibited as a museum "freak." The deformity confirmed the newer conceptions as to the nature of a pygomelus, namely, that the monstrosity results from the fusion of two beings.

74. **Operation for Very Large Goiter.**—The patient succumbed the day after the operation in the case reported, and this fatality teaches the importance of introducing a tracheotomy tube before removing the lobes of a very large thyroid, and also that the tube must be extra long, as the trachea cannot be depended on in these cases until the lower part is reached.

Presse Médicale, Paris

August 31, XX, No. 71, pp. 721-728

76 Technic for Suturing Blood-Vessels. (Les causes d'insuccès dans la suture vasculaire.) R. Danis.
77 The Immediate Results of Artificial Pneumothorax. R. Burnand.

Archiv für Kinderheilkunde, Stuttgart

LVIII, Nos. 4-6, pp. 241-481. Last indexed August 3, p. 406

78 Albumin Milk. (Erfahrungen mit Eiweissmilch.) J. Cassel.
79 Commercial Infant Foods. (Kindernährmittel im Handel.) H. Kühl.
80 Brain Tumor in Girl of Five with Blindness from Atrophy of Optic Nerve. (Hirngeschwülste im Kindesalter.) W. P. Shukowsky and A. A. Baron.
81 *Cutaneous Reaction to Diphtheria and Typhoid Toxins. F. v. Szontagh.
82 Case of Posterior Basal Meningitis. E. Hartje.
83 Measles and Its Mortality. (Die Hospitalmasern und Sterbecasuistik nach Masern.) G. E. Wladimiroff. (Die Masernepidemie des Jahres 1830, beobachtet in Elberfeld.) C. H. Pagenstecher.

81. **Cutaneous Reactions with Diphtheria or Typhoid Toxin.**—Szontagh reports extensive research on the way in which the skin of children reacts to inoculation of bacterial toxins. A positive reaction was obtained in 38 per cent. of the 448 children inoculated with diphtheria toxin, but only in four of the seventy-two inoculated with typhoid toxin. The tuberculin skin test was applied to the arm at the same time with the diphtheria toxin in 156 children, but there was no concordance between the results. The most pronounced reaction to the diphtheria toxin was obtained in the group of 47 per cent. responding positively among the 168 scarlet-fever patients tested. This confirms the assumption which he has advanced that scarlet fever and febrile sore throat are allied affections. The identity of the environment explains the multiplicity of cases in many instances, he thinks, where the affection is not of the generally accepted contagious types. The main point emphasized by his research is that different individuals react to the same agent in widely diverse ways.

Archiv für klinische Chirurgie, Berlin

XCVIII, No. 4, pp. 843-1102. Last indexed August 17, p. 582

84 *Incarceration of Joints. (Ueber Gelenkeinklemmungen und ihre Behandlung, mit bes. Berücksichtigung der Interposition des verletzten Meniscus im Kniegelenk.) M. Katzenstein.
85 Perineal Hernia. A. Exner.
86 Volvulus of Sigmoid Flexure. H. Finsterer.
87 Metastatic Paranephritic Abscesses. O. Harzbecker.
88 Anatomic Causes for Peristalsis of the Large Intestine. F. Rost.
89 *Diplococcus Peritonitis. H. Salzer.
90 Osteoplastic Restoration of Lower Jaw. (Klinischer Beitrag zu dem osteoplastischen Ersatz der Unterkieferdefecte.) G. Nyström.
91 *Operative Infection of the Pleura and Draining the Thorax. M. Tiegel.
92 *Continuous Draining for Ascites. (Versuche mit Dauerdrainage bei Ascites.) F. Franke.
93 Traumatic Pseudomeningocele. Helsted.
94 *Treatment of Cirrhosis of the Liver by an Eck Fistula. P. Rosenstein.
95 *Chondrotomy for Apical Tuberculosis. (Die Freund'sche Operation bei Lungenspitzentuberculose.) W. Kausch.

84. **Internal Derangement of Joints.**—Katzenstein has found that a joint can be thrown out of gear by even a very minute foreign body finding its way between the surfaces of the bones forming the articulation. The trouble is not so much mechanical as by the pain induced when the joint is moved, this pain causing reflex muscular contraction and thus arresting the movements of the joint. With a rheumatic shoulder trouble, the symptoms are the same as with a foreign body, and the trouble is probably incarceration of some product of inflammation. The knee may have some loose body of bone or cartilage, a fat tumor, the joint capsule may be torn or a semilunar cartilage injured by direct trauma or by a sprain in rotation, flexion or extension or by violence acting along its axis. As the loose cartilage gets between the surfaces forming the joint, there is sudden intense pain and the knee is drawn up. When the loose portion of the cartilage or capsule is permanently fixed between the joint surfaces, there is pain on long standing or walking. When a semilunar cartilage has been recently injured, there is generally effusion of blood into the joint with immobility of the joint and later circumscribed tenderness at the inner or outer cleft in the joint, and the cartilage is movable. Conservative treatment of a recent injury of a semilunar cartilage is promising, rest in bed, prevention of any strain on the knee, all aiming to favor the healing of the cartilage in its normal place. But if the injury is of longer standing, an operation is necessary to restore normal conditions. If the cartilage is much out of shape it will have to be removed, the results of which are always dubious. If it has retained its normal shape, it can be sutured in place. He regards the semilunar cartilages as so important that he never removes one unless absolutely necessary, and he makes a point of replacing it in its normal position, cutting the ligaments if necessary to obtain better access. The results of treatment on these principles have been most excellent in the twenty-three cases reported in detail with twelve illustrations showing the different types of injury.

89. **Diplococcus Peritonitis.**—Salzer warns that operative treatment of diplococcus peritonitis is dangerous in the first stage of the disease. Of the thirteen children operated on during the first stage, eleven died; in his own experience three died of the four thus treated. On the other hand, operative treatment at the proper time, namely, evacuation of the abscess by a laparotomy when the process has localized in the abscess, may be regarded as the only means to save the patient. In the after-treatment serotherapy might be useful. Differentiation is extremely important, as instead of the early operation required for appendicitis, the only safety is in delaying the operation until the abscess has formed. These patients are generally girls. In the midst of health they suddenly develop abdominal pain, vomiting and diarrhea, the child apparently very sick, with circles around its eyes, cyanotic face, herpes on the lips, the abdomen little if any distended, and of a peculiar soft, doughy resistance without special rigidity of the muscles, possibly slight tenderness in the ileocecal region, but the lung and heart are apparently normal. The incongruity between the severe clinical picture and the comparatively slight objective findings, even on palpation through the rectum, are characteristic. In Salzer's eight cases of acute pneumococcus peritonitis, only three of the children presented all the above symptoms, but all had the abdominal pains, vomiting and diarrhea; five had the herpes also, and four the cyanotic face. One child of 9 did not vomit, but the abdomen had a soft, doughy feeling and there was diarrhea. On account of slight rigidity in the ileocecal region, appendicitis was suspected and the abdomen opened. The appendix was normal, and only a little turbid serous effusion was found, which was evacuated. The child died. Bacteriologic examination of the blood would have possibly warned against the operation and the child might have been saved. The agglutination test is also useful to aid in the differentiation, and the blood picture is also characteristic—high leukocytosis, large polynuclear leukocytes with neutrophil granulations and a close and abundant fibrin network. Streptococcus peritonitis presents about the same picture as the diplococcus, even to the herpes. Of the two cases with this reported, one child died in a few days without an operation; the other was tided past the first stage and then a laparotomy was done and the child recovered.

91. **Operative Infection of the Pleura.**—Tiegel ascribes the frequent infection of the pleura in operations on the chest to the fact that the pleura is not able to stand the vicissitudes to which it is exposed when the thorax is opened, the chilling, drying, contact with sponges, instruments and hands. It seems to be much more sensitive than the peritoneum. Even when the operation has been concluded without direct infection, the pleura may become infected from the lung; this was demonstrated beyond question in two of his cases. His experimental and clinical experience has shown further that a postoperative pleural effusion, even when it is aseptic, is an important factor in the development of infection in the pleura and postoperative pneumonia. Consequently, the evacuation of this effusion is imperatively needed, and he has devised a valve drain which

seems to answer the purpose admirably. It is necessary to have the drain introduced at the proper point to actually evacuate the fluid and short enough not to project above the surface of the effusion.

92. **Continuous Drainage of Ascitic Fluid.**—Franke has done omentopexy in five cases to drain away ascites and the result was an entire success in three. The last patient thus treated was a woman of 57 with syphilitic cirrhosis of the liver and the operation cured the tendency to ascites. His failures in the other cases and in a number on record constrained him to seek a better way, and he thinks he has found this in diverting the fluid into the subcutaneous tissue. In the two cases in which he has applied this technic, the patients were permanently cured of the ascites, as was demonstrated at necropsy. One was a woman of 48 with ascites from cirrhosis of the liver, the other a woman of 71 with chronic serous peritonitis. He gives an illustration of the different means in vogue for thus diverting the effusion and comments on the disadvantages of most of them, which he thinks he has avoided by his technic. He uses merely a silver wire to keep the hole open. The silver wire is loosely twisted double and then pulled into the shape of a letter H, only that one side is 10 and the other only 2 cm. long. The wire on the short side is spread out in a flat figure-8 shape, and this is introduced into the abdominal cavity, the long side fitting in the loose subcutaneous tissue above. The effusion oozes out along the cross-piece, and its drainage and distribution are facilitated by three strands of silk passed over the long wire and spread out horizontally in six directions in the loose subcutaneous tissue. This operation permanently diverted the fluid from the abdominal cavity and the wire healed in place without any inflammatory reaction, but the progress of the underlying disease rendered a permanent recovery impossible. He thinks that mild, chronic, serous peritonitis might be cured by the measure and a number of other conditions materially improved.

94. **Anastomosis Between Portal Vein and the Inferior Vena Cava in Treatment of Cirrhosis of the Liver.**—This operation, known as Eck's fistula, has often been done in experimental research, and Jerusalem and Franke have worked out the technic on the cadaver, devising special clamps to facilitate the procedure. The complete success of omentopexy in 20 per cent. of the 120 cases in which it has been applied (Credé, 1910), shows that the assumption that the ascites is the result of backing up from compression of the branches of the portal vein by the shriveling of the liver tissue around them certainly applies to a certain proportion of cases. In others some other mechanism must be invoked, possibly irritative processes in the peritoneum. Rosenstein reports a case in which he applied the Eck fistula technic in treatment of severe ascites in a woman of 60, previously healthy and without much disturbance from the cirrhosis except enormous ascites. The anastomosis was made without much difficulty, the veins being held by a stout thread passed around each vein above and below the field of operation; traction on the threads arrested the circulation in the veins at will and proved very useful in the course of the operation. The patient bore the operation well and it seemed to be a technical success, but the anticipated result was not attained. The ascites recurred as before and tapping was necessary, but the intervals have grown longer and the amounts less, four weeks now being required for accumulation of 7 liters of fluid instead of two weeks as at first. Before the operation 10 liters had been evacuated at a time and at very short intervals.

95. **Chondrotomy for Apical Tuberculosis.**—Kausch has performed the Freund operation, severing the cartilage of the first rib to mobilize the rigid upper aperture of the thorax, in five cases to date, and the interval since has been from three to over four years. All the patients were benefited apparently by the operation, and no harm was done in any instance nor in the four operations of the kind that have been reported by others. None of his patients seems to have been definitely cured, but all are free from tubercle bacilli in the sputum and have full earning capacity, although they occasionally cough a little. He urges internists to pay greater attention to this method of treating apical tuberculosis rebellious to other measures or constantly recurring. In all his cases the ribs sprung apart at once the moment the cartilage was divided, thus providing better conditions for the functioning of the apex.

Beiträge zur klinischen Chirurgie, Tübingen

July, LXXIX, No. 2, pp. 233-475

96 Ligation of Jugular Vein for Otogenous Thrombosis; Thirty-Four Cases. (Unterbindung der Vena jugularis bei otogener Thrombose.) W. Krawtschenko.
97 *Arteriovenous Anastomosis for Gangrene of the Leg. (Die Wietingsche Operation.) H. Hauke.
98 Experimental Research on Etiology of Appendicitis. (Wurmfortsatzentzündung.) H. Bolt and M. Heyde.
99 *Ultimate Outcome of Operative Treatment of Exophthalmic Goiter. (Dauerresultate der operativen Behandlung des Morbus Basedowii.) Weispfenning.
100 Appendectomy; 4,000 Cases. (Erfahrungen und Resultate unserer Perityphlitisbehandlung bei 4,000 operierten Fällen.) H. Hoffmann.
101 Fracture of the Heel Bone. (Neuere Beobachtungen über die Calcaneusfraktur.) C. Westphal.
102 Sprain Fracture of Young Bones. (Stauchungsbrüche der kindlichen und jugendlichen Knochen.) H. Iselin.
103 Experimental Gastric Ulcers. (Experimentelle Erzeugung von Magengeschwüren.) C. Licini.

97. **Arteriovenous Anastomosis for Gangrene of the Leg.**—Hauke reviews the experiences in this line on record and compares them with his work on the cadaver. His conclusions are decidedly unfavorable to the feasibility of the operation advocated and performed by Wieting. He is inclined to attribute the few successes realized to a natural spontaneous turn for the better.

99. **Ultimate Outcome of Operative Treatment for Exophthalmic Goiter.**—Weispfenning tabulates the details of sixteen cases of Basedow's disease in which more or less of the goiter had been removed by Kümmell from two to over twenty-one years before. Immediate benefit was evident in every one of the thirty-five patients given operative treatment, and in some this benefit proved permanent. The experiences related teach anew the importance of the blood-picture for detecting the hyperthyroidism in an early stage and for sifting out the really severe cases. An early operation not only offers the best chances for a successful outcome, he declares, but it may be regarded as harmless before the organism has been suffering too long from the toxic influences emanating from the thyroid.

Berliner klinische Wochenschrift

August 26, LXIX, No. 35, pp. 1645-1688

104 *Menstrual Mental Disturbances. (Zur Klinik des menstruellen Irreseins.) H. König.
105 Technic for Suturing Abdomen After Cholecystectomy. (Verschluss der Bauchhöhle nach der einfachen Cholecystektomie.) A. Goldmann.
106 Influence of Hemolysins on Tissues Being Cultivated in Vitro. (Einfluss der Hämolysine auf die Kultur lebender Gewebe ausserhalb des Organismus.) S. Hadda and F. Rosenthal.
107 Technic for Artificial Pneumothorax. (Zur Technik des künstlichen Pneumothorax.) M. Bonniger.
108 Potato Medium for Cultivation of Tubercle Bacilli. R. Turro and J. Alomar.
109 Congenital Synostosis in the Forearm. (Zur Kenntnis der kongenitalen Vorderarmsynostosen.) E. Melchior.
110 Local Treatment of Duodenum Through Duodenal Catheter. (Behandlung des Dünndarms mit gasförmigen und verneblten Medikamenten.) M. Skaller.
111 Acquired Hypersensitiveness of the Skin. (Erworbene Ueberempfindlichkeit der Haut.) A. E. Stein.
112 Modified Gram Stain. (Ueber eine Modifikation der Gramfärbung besonders mit Rücksicht auf die Gonokokkendiagnose.) V. Jensen.

104. **Menstruation Psychoses.**—Of the seven cases of transient mental disturbances occurring in connection with menstruation which König has encountered, three passed into a chronic phase in time; in the three in this group the mental disturbance had been first observed before the age of 20. In the four other cases they had not developed until 30 or 40, and the psychoses did not return later, none of the patients having shown any recurrence of the tendency for from three to seven years to date. He thinks that these menstruation psychoses must be comparatively common, but medical aid is not sought on account of the transient nature of the trouble. They have no special stamp beyond the tendency to recur in circles. In one of his cases a period of several days of agitation alternated with normal days, the normal period growing constantly longer until there was only one day of agitation and hallucinations, corresponding to the rise of the menstrual wave. The trouble subsided entirely by the end of the tenth month, and there has been no recurrence during the seven months since. Examination during the intervals for possible hysteria is very important in such cases.

Deutsches Archiv für klinische Medizin, Leipsic

CVII, Nos. 3-3, pp. 113-304. Last indexed August 3, p. 407

113 Innervation of Male Sexual Organs. (Innervierung der männlichen Geschlechtsorgane.) L. R. Müller and W. Dahl.
114 Apparatus for Respiration. (Universalrespirationsapparat.) F. G. Benedict (Boston).
115 Alcohol Useful in Severe Diabetes. (Zur Pathologie und Therapie der schwersten Diabetesfälle.) E. Grafe and C. G. L. Wolf.
116 The Carbon Dioxid Tension in the Alveolar Air in Acute Febrile Diseases. (Kohlensäurespannung in der Alveolarluft der Lungen bei akut febrilen Krankheiten.) L. S. Fridericia and O. Olsen.
117 The Mechanism of Respiration in Cardiac Dyspnea. (Die funktionelle Bedeutung der Atemmechanik und die Lungenventilation bei kardialer Dyspnoe.) R. Siebeck.
118 The Pulse in Elastic Arteries. (Die Pulsform in elastischen Arterien.) R. Friberger and E. Veiel.
119 Rapidity of Pulse Wave in Arteries With Palpable Thickening of the Walls. (Pulswellengeschwindigkeit bei Arterien mit fühlbarer Wandverdickung.) R. Friberger.

No. 4, pp. 305-410

120 The Nitrogen and Salt Content of Sweat in Kidney Disease. (Stickstoff- und Kochsalzgehalt des Schweisses von Nierenkranken.) P. Tachau.
121 Influencing of Resistance of Red Corpuscles by Blood-Destroying Substances. (Beeinflussung der Resistenz der roten Blutkörperchen durch hämatoxische Substanzen.) E. Handrick.
122 *Clinical Course of Paratyphoid B. Infections. H. Freund.
123 Paroxysmal Hemoglobinuria and Isolysins. J. Matsuo.
124 *Lymphatic Pseudoleukemia; Ten Cases. S. Laache.
125 The Electrocardiogram With Acute Parenchymatous Degeneration of the Heart Muscle; Phosphorus and Arsenic Poisoning. E. Schott.
126 Study of Paradoxic Movements of the Diaphragm. (Experimentelle Untersuchungen über die Aktionsströme des Zwerchfelles bei geschlossenem Pneumothorax.) C. Wellmann.

122. **Paratyphoid Infections.**—Freund reports seventy cases in the last two years in the Heidelberg clinic which were demonstrated bacteriologically and serologically to be paratyphoid infections. The clinical manifestations were extremely varied. In eight cases the symptoms were those of typical typhoid fever. The majority—about fifty—were diagnosed clinically as acute gastro-enteritis. It was very severe in four cases, resembling cholera. All these patients recovered under administration of camphor, epinephrin, caffein and injection of normal salt solution. He thinks it of great importance to distinguish these cases of paratyphoid gastro-enteritis clearly from abdominal paratyphoid. In the former there are no characteristic changes post mortem, while in the latter the necropsy findings are similar to those of typhoid. It is the severe gastro-enteritis, however, resembling cholera, which is most apt to prove fatal, while the abdominal paratyphoid has a better prognosis than typhoid. He thinks the gastro-enteritis cases have a very short incubation period, while that of the abdominal paratyphoid is about the same as in typhoid. In three of the cases the same patient had both forms, a typical abdominal paratyphoid following one or two weeks after an acute gastro-enteritis. In eight cases the symptoms were so similar to those of appendicitis that the patients were at first sent to the surgical clinic. The enlarged spleen and the severe diarrhea enabled them to correct the diagnosis. Examination of stools showed the paratyphoid bacillus in pure culture. In one case there was actually an appendicitis with perforation, evidently the result of localized paratyphoid infection. In seven cases there were gall-bladder complications, in four of which they were evidently caused by the paratyphoid bacillus, the others having had cholelithiasis before the gastro-enteritis. Clinically, it is important to note that all these patients were dismissed while still bacillus carriers. Two patients had pyelitis and one epididymitis, but in the latter case only staphylococci were demonstrated in the pus, so it was probably an intercurrent infection. Three patients had hemorrhagic nephritis during the attacks, but terminating in complete recovery; one patient with previously normal kidneys developed a chronic nephritis and a systolic heart murmur. She was in the clinic three months. Three cases are cited (Sion and Hegel) in which paratyphoid attacks were followed by endocarditis with recovery. There were a few cases which ran an atypical course. In two there was a long period of subfebrile temperature, returning to normal in one case on the sixty-sixth day, in the other on the thirtieth. Another patient had a typical attack of abdominal paratyphoid from July 15 to September 17; October 1 his temperature again rose to 39 C. The most striking feature was the blood-picture; leukocytes between 5,000 and 7,000, 65 to 73 per cent. being lymphocytes, mostly small ones. He continued to run a high remittent temperature, 36 to 39 C., until January 11. On the 205th day after first being taken sick he was entirely normal except for a moderate anemia. Throughout the second illness bacteriologic examination was negative. In several cases high lymphocyte counts were the rule—48 to 56 per cent. This seems to Freund to show that paratyphoid infection leaves a tendency to disease of the blood-forming organs.

124. **So-Called Lymphatic Pseudoleukemia.**—Laache reports ten cases diagnosed as lymphatic pseudoleukemia during the past twenty-five years at the hospital at Christiania, among the 10,000 patients that have been treated there. Eight of these cases were encountered during the last six years. In six of these cases post-mortem examinations were made. In one case there was extensive caseous degeneration of the lymph-nodes; this was undoubtedly tuberculous pseudoleukemia. In two cases (besides in one diagnosed from an excised gland during life) granuloma was demonstrated. The tenth case proved to be a round-celled sarcoma. Lymphatic pseudoleukemia includes, he says, two chief groups, the granulomatous and the sarcomatous. True sarcoma growths he excludes. The granulomatous form has many points of resemblance to tuberculosis, especially a high, often hectic fever, night sweats, tachycardia and diazo reaction in the urine. Therapeutically, the ordinary arsenic-roentgen-ray treatment prolongs life, but seldom for more than one or two years. The value of tuberculin has not yet been determined. Pinkus advises cutting out glands. From this, however, no benefit was derived in the one of these cases in which it was tried.

Deutsche medizinische Wochenschrift, Berlin

August 29, XXXVIII, No. 35, pp. 1625-1672

127 Hematuria. (Diagnose und Therapie der Blutungen aus dem Harnapparat.) L. Casper.
128 Bacteriologic Study of Lupus I. (Untersuchungen über den Typus der Tuberkelbazillen bei Lupus vulgaris.) F. W. E. Rothe and Hierotte.
129 Superior Bactericidal Action of 70 per cent. Alcohol Due to its Action on Dry Albumin. (Warum wirkt gerade 70 per centiger Alkohol so stark bakterizid?) E. Frey.
130 Drainage Useless in Diffuse Peritonitis. (Zur Frage der Peritonealdrainage bei Peritonitis diffusa.) W. Scheidtmann.
131 *Retroperitoneal Hematoma. A. Wagner.
132 Congenital Dropsy. (Zur Lehre von der Schriddeschen allgemeinen angeborenen Wassersucht.) Loth.
133 *Chalazion. Wätzold.
134 Disease of the Lacrimal Duct. (Ueber die rhinogene Beteiligung der Tränenwege, insbes. den Zusammenhang der chronischen Dacryocystitis mit den Erkrankungen des Siebbeins und ihre Behandlung.) H. M. H. Rhese.
135 The Wassermann Reaction With Non-Activated Serum. R. Pereira.
136 Prophylaxis of Oxygen Poisoning By Keeping Air Moist. (Ueber Sauerstoffvergiftung.) A. Brüning.

131. **Retroperitoneal Hematoma.**—Wagner's patient was a young clerk who had received a blow in the left side during a football scrimmage. He continued in the game for an hour, but then the pains became so severe that he was on the table by the seventh hour, the signs indicating internal hemorrhage. A large tumor had also developed and the pallor and fluttering pulse resembled the picture of ruptured tubal pregnancy. The urine was normal. The hematoma was evacuated and the patient was on his feet in two weeks. Nothing was found to suggest a source for the hemorrhage. This was the case also in another young man with a spontaneous hematoma in the left retroperitoneal space. He had repeatedly passed gallstones, and over a year before had been in the hospital for ileus, from which he recovered without an operation. He has never been quite strong since, and it is possible that there may have been retroperitoneal hemorrhage at that time. The tumor resembled a large ovarian cyst and contained old blood. In a third case the hemorrhage started while the man was lifting a heavy weight. He kept at work for four weeks before the increasing size and pain of the hematoma drove him to the hospital.

133. **Meibomian Cyst.**—Wätzold has been making an extensive study of chalazion, and states that it does not develop in the tarsal cartilage as generally taught, but spreads from the inflamed meibomian gland through the loose tissue between the muscle and the tarsus. The primary inflammation yields to formation of granulation tissue, and recurring inflammation in the meibomian gland keeps up the irritation. As it is practically a chronic process, its operative treatment is indi-

cated, as a rule, under local anesthesia, scooping out the lump or enucleating it like an atheroma with knife or scissors after a perpendicular incision over the hard bunch.

Deutsche Zeitschrift für Chirurgie, Leipsic

August 1, CXVIII, Nos. 1-2, pp. 1-204

137 *Indications and Technic for Surgery of the Liver. (Ueber Leberverletzungen. Eine experimentelle und klinische Studie.) H. Finsterer.
138 *Compressed Air as Therapeutic Measure. III. (Der Luftkompressor im Krankenhaus.) F. Kuhn.
139 *Cancer of the Clavicle. (Ueber bösartige Schlüsselbeingeschwülste.) S. Johansson.
140 Gasserectomy with Overhanging Head. (3 Fälle von Totalexstirpation des Ganglion Gasseri bei besonderer Kopflage—überhangendem Kopf.) L. M. Pussep.
141 Technic for Aneurysm Operation. (Beitrüge zur idealen Aneurysma-Operation. Ueber die zirkuläre Gefässnaht und über die Transplantation der Gefässe am Menschen.) K. Omi and H. Yamanouchi.

August 15, Nos. 3-4, pp. 205-402

142 *Invagination of Intestine for Which a Tumor Was Responsible. (Tumorinvagination des Darms.) E. Kasemeyer.
143 *Influence of Aseptic Inflammation on the Dissolving of Catgut. (Einfluss einer aseptischen serösen Entzündung auf die Katgutauflösung.) M. Callam.
144 Origin and Treatment of Fracture of Neck of Femur in the Young. (Schenkelhalsbrüche im Wachstumsalter.) G. Dencks.
145 An Unusual Form of Fetal Chondrodystrophy. G. Dencks.
146 Technic for Appendicitis Incision. (Zur Bewertung des erweiterten Zickzackschnittes bei Wurmfortsatzoperationen.) M. Cohn.
147 Removal of Entire Left Lower Jaw. (Die totale Exartikulation der Mandibula und ihr prothetischer Ersatz.) F. Erkes and F. Ernst.
148 Cause of Hemorrhage in Bed of Kidney. (Zur Frage der Herkunft der Massenblutungen ins Nierenlager.) E. Koch and A. Läwen.
149 Gastrostomy and Plastic Operations on the Esophagus. A. Jianu.
150 Primary Cancer of the Appendix in Girl of 17. (Zur Kasuistik des primären Krebses des Wurmfortsatzes.) O. Butzengeiger.
151 Experimental Exclusion of Part of Intestine. (Die Darmausschaltung mit dem Verfahren von Parlavecchio.) M. Dominici.

137. **Injuries of the Liver.**—Finsterer discusses some of the more important points in symptomatology and treatment, as studied in the literature and also in two stab wounds of the liver personally observed, one bullet wound and eight cases of injury from contusion. He reports further the results of experimental research which confirm the great diagnostic value of bradycardia following contusion of the liver. It is the result of the action of bile acid, and is thus a highly characteristic symptom. Even when, on account of excessive hemorrhage, the pulse did not grow slower, the absorption and elimination of the bile salts could be detected by appropriate tests. A subcapsular rupture of the liver may not entail the picture of anemia, and the abdomen walls may be rigid after a contusion, even when the cavity within is intact. The pulse is the most reliable guide. If it is strikingly slow at the first examination, injury of the liver may be suspected. This is still more significant when the bradycardia develops while the patient is under observation. Local pain in the liver, radiating toward the back or right shoulder is also significant; it was very pronounced in three of his eight cases of rupture of the liver. Also the spreading of the pain over the entire lower abdomen and the increasing rigidity of the walls, showing that some foreign substance, blood or stomach or bowel content, is spreading through the cavity. An exploratory laparotomy under local anesthesia is much less dangerous than puncture and should always be given the preference in the hospital. Finsterer reviews a total of 130 articles on surgery of the liver and describes the preferable technic.

138. **Compressed Air Massage.**—Kuhn gives several illustrations of the double-walled, compressed-air bag he uses for regional stimulation of the circulation. It expels the venous blood and lymph and stimulates production of new, healthy tissue. The compression is applied intermittently by a clockwork under control of the patient. The benefit was especially marked in old torpid leg ulcers and varices in general.

138. **Cancer of the Clavicle.**—Johansson reports three cases and summarizes thirty-six from the literature, citing six further cases. In the last forty years at the Stockholm surgical clinic, in the total sixty-two cases of sarcoma in a bone, the clavicle was the site in three, the upper jaw in eleven and the lower in nine, the femur in sixteen. The primary mortality with cancer of the clavicle is low but there is an unusual tendency to recurrence and metastasis.

142. **Invagination of Intestine from Tumor.**—Kasemeyer has encountered a case of this kind and collected 284 from the literature. The invagination was due to a cancer in 30 or 38 per cent. of the cases, and in two cases of sarcoma the patients were under 5; in two between 5 and 10, and in two between 10 and 20. The youngest carcinoma patient was over 20. The entire 284 cases are summarized and classified. They teach the necessity for operative treatment in all cases, with resection on suspicion of cancer.

143. **Experimental Research on Absorption of Catgut.**—An aseptic inflammation in the mice used for Callam's experiments always retarded the absorption of the catgut sutures. This finding sustains the assumption that an aseptic inflammation is a healing process; that is, the conditions which prevent the dissolving of the catgut also serve to protect the tissues involved against injury. The slower and the gentler the abnormal chemistry generated by the inflammation-causing agent, the more chance is given the tissues to rally their forces and combat the invaders. The facts observed also explain why antiseptic catgut is absorbed more slowly than the aseptic.

Medizinische Klinik, Berlin

September 1, VIII, No. 35, pp. 1413-1450

152 Treatment of Cataract. (Wann darf der graue Star operiert werden?) W. Goldzieher.
153 *Death Immediately After Removal of Adenoids and Tonsils in Out-Patient. Kafemann.
154 Case of Miliary Tuberculosis with Typhoid Bacilli in the Urine. W. Schott.
155 Influence of Drugs on Opsonic Index. (Ueber pharmakodynamische Einflüsse auf den opsonischen Index.) A. Strubell.

September 8, No. 36, pp. 1451-1484

156 Hemorrhage During Pregnancy. (Ueber seltenere Ursachen von Schwangerschaftsblutung.) v. Franqué. Concluded in No. 37.
157 Anesthetics in Obstetrics and Gynecology. (Ueber Schmerzlinderung und Schmerzverhütung in Geburtshilfe und Gynäkologie.) O. Bondy.
158 Pregnancy Psychoses. (Ueber Schwangerschaftspsychosen mit bes. Berücksichtigung der Indikation zum künstlichen Abort.) Raecke.
159 Postmortal Contractions of the Heart. (Postmortale Herzcontractionen beim Menschen.) L. Drozynski.
160 *Operative Treatment of Puerperal Pyemia. O. Hoehne.
161 Polycythemia. (Ueber Polycythaemia rubra.) J. Löwy.
162 Chemotherapy of Cancer. (Neuere Publicationen zur Chemotherapie der malignen Geschwülste.) R. Werner, S. Szecsi and V. Czerny.

153. **Fatality After Operation on Throat.**—The case reported by Kaufmann teaches the importance of having the patient in the hospital a day or so before the operation. The robust boy of 14 had very large tonsils and adenoids. He would not permit the completion of the attempted tonsillectomy under local anesthesia, so an appointment was made for him to be brought for general anesthesia. The mother was warned not to let him have anything in the morning but a little tea, but he ate a hearty breakfast and a pound of cherries. He vomited profusely and collapsed after the operation and could not be roused. The case teaches further that before doing such an operation under general anesthesia, roentgenoscopic examination should be made to determine whether there are enlarged lymph-nodes in the thorax. In this case the thymus weighed 40.5 gm. and many of the lymph-nodes were much enlarged. The heart was large and flabby but the heart sounds had been pure.

160. **Operative Treatment of Puerperal Pyemia.**—Hoehne reports a case of staphylococcus pyemia after extraction of the placenta by hand in which he successfully excised the local process. The ovarian vein was ligated twice above the palpated thrombus, and the ovary and tube on this side and a suppurating focus in the adjoining psoas were all removed together, severing connections with the thermocautery. After clearing out the field of operation as much as possible, the three veins forming the main iliac vein were also ligated and the entire field of operation was roofed with peritoneum, 30 c.c. of 1 per cent. camphorated oil was then poured in and the abdomen sutured. The chills ceased at once after the veins were ligated, and recovery was soon complete. The operation was undertaken the twenty-fourth day after delivery and sixteen days after a prophylactic injection of

30 c.c. of 1 per cent. camphorated oil. There had been twelve chills and the intervals were growing shorter when the operation was done.

Mitteilungen aus den Grenzgebieten der Med. u. Chir., Jena

XXV, No. 1, pp. 1-210. Last indexed July 13, p. 154

163 Mechanical Theory of Origin of Neoplasms. (Fall von angeborenen transversalen Kommissuren des Mastdarmes, mit bes. Berücksichtigung der mechanischen Theorie der Neubildungen.) N. Trinkler.
164 Spinal Cord Tumor Successfully Removed. (Fall von Rückenmarksgeschwulst der höchsten Cervicalsegmente. Operation. Heilung.) G. Söderbergh and V. Akerblom.
165 *Tardy Deformity of Cartilage. (Chondrodystrophia adolescentium s. tarda.) G. W. Schorr.
166 *Cause of Fatal Tardy Hemorrhage After Tracheotomy in Diphtheria. (Zur Kenntnis tödlicher Spätblutungen nach dem Luftrährenschnitt bei Diphtherie.) G. A. Lallemant.
167 *Ultimate Outcome of Treatment of Trigeminal Neuralgia. (Vergleichende Untersuchungen über die Erfolge der chirurgischen Behandlungsmethoden bei Trigeminusneuralgie.) K. Otto.
168 *Iodin in Treatment of Tuberculosis. G. Hotz.
169 Intestinal Actinomycosis. F. König.
170 *Suppuration at Site of Lumbar Puncture. (Zur Frage der Stichelterung nach Lumbalpunktion.) E. H. B. van Lier.
171 Operative Treatment of Actinomycosis of the Lungs. W. Bauer.
172 *Experimental Intravenous Serotherapy of Tetanus. E. v. Graff.
173 *Clinical Importance of Antitrypsin in Blood-Serum. E. Waelli.
174 Peristalsis and Antiperistalsis in Large Intestine. (Ueber die Peristaltik und Antiperistaltik des menschlichen Dickdarmes.) O. Roith.

165. **Tardy Chondrodystrophy.**—Schorr reports a case which had the appearance of tardy rachitis, but the pathologic process was found to be located in the zone of enchondral ossification, similar to the anomalies in fetal chondrodystrophy but differing in the fact that only bones were affected which had been developing previously quite normally. Three of the patient's sisters had the same anomaly, and in all it had manifested itself at puberty.

166. **Tardy Hemorrhage After Tracheotomy.**—Lallemant adds three cases to the six on record in which a fatal hemorrhage developed a few days after tracheotomy. The causes were necrosis from pressure of the cannula or arrosion of vessels from a diphtheric or phlegmonous process. The personal cases reported show that an inflammatory process may exist in the depths of the tissues, not macroscopically evident but yet capable of entailing suppurative destruction of the wall of an artery. The conditions therefore are those of ordinary arrosion; they have been mysterious and unexplained to date simply because microscopic examination had not been made.

167. **Comparison of the Results of Various Methods of Treating Trigeminal Neuralgia.**—Otto reviews the literature to date and the outcome in forty-two cases of trigeminal neuralgia in which surgical measures were applied at Kiel during the last twelve years. Thirty-six of the patients filled out the question-blanks inquiring as to their present condition. Comparing these data and the anatomic findings in 100 skulls and a number of cadavers shows that recurrence is the rule after peripheral operations on the trigeminal nerve. The interval is only a few months in most cases. Recurrence takes place also after resections at the base of the skull, but it is less frequent. Gasserectomy gives the best results, provided it is complete. It should be reserved, however, for the most desperate cases, especially those with involvement of all three branches. These disappointing results throw into still brighter light the efficacy of injections of alcohol; 70 or 80 per cent. alcohol is the best means yet known to block the nerves without injuring adjacent tissues. Deep injection at the base of the skull arrests the neuralgia at once, even in severe cases, and keeps the domain innervated by the treated branch without sensation for months. These deep injections can be repeated without danger; they are effectual then for a still longer period, but time only can show whether the patients are permanently cured. The method of locating the nerve introduced by Offerhaus is simple and easy, Otto says, even without practice. The round or oval foramen can thus be located with great certainty. (The technic was described and illustrated in THE JOURNAL, 1910, lv, 1152.) Otto reiterates that this alcohol injection method is free from danger and can be utilized for local anesthesia in this region for operative work.

168. **Iodin in Treatment of Surgical Tuberculosis.**—Hotz states that the organism reacts with a lively increase in the number of lymphocytes to the application of iodin in the five various forms of its administration; subcutaneous or intravenous injection of iodoform or tincture of iodin, inhalation or inunction, both in the tuberculous and the healthy. The marked lymphocytosis sets in the third day. He explains the benefit from iodin thus as a vital reaction, the first manifest sign of which is the lymphocytosis. The ferment of the lymphocytes acts on fat, including the fat of bacteria. Of forty-nine tuberculous joints he has treated on this principle, thirty-one healed without impairment of motility and thirteen healed with ankylosis; there were only five failures.

170. **Suppuration of Puncture Hole after Lumbar Puncture.**—The diagnosis in the case reported wavered between typhoid, sepsis and miliary tuberculosis. An abscess in the sacrospinal muscle was not discovered until the needle in the exploratory lumbar puncture had passed through it and carried staphylococci into the limpid spinal fluid. As the fluid was only slightly contaminated, no harm was done. The outcome was less favorable in another case in which lumbar puncture proved difficult on account of malformation of the spinal canal, and the meninges became infected. The patient before had had merely severe spinal symptoms without fever, but the evening of the day of the puncture the temperature ran up to 40 C. and the pyemia proved fatal. Necropsy disclosed an encapsulated suppurative meningitis and bilateral abscesses in the psoas but no diffuse meningitis. The meninges above had resisted the infection and the encapsulation had further protected them. The danger of infection from lumbar puncture has been so impressed on van Lier by these occurrences that he now proposes a prophylactic injection of hexamethylenamin before any lumbar puncture.

172. **Experimental Research on Intravenous Serotherapy in Tetanus.**—The results of the extensive research reported indicate that intravenous injection of serum is far more effectual than is generally recognized, most writers ranking it little above the subcutaneous route. The intravenous injection of the serum at the same time as intramuscular injection of the tetanus toxin regularly prevented the development of tetanus in the experiments, as also when the toxin was injected into the nerve. After the tetanus had developed, the intravenous injection prolonged life, and in some instances the animals recovered after local tetanus had developed. The main point, Graff emphasizes, is to give enough of the serum. The results are better in children than in adults, probably because larger amounts per bodyweight can be injected. The aim should be to use large amounts and a highly concentrated serum.

173. **The Clinical Importance of Antitrypsin in Serum.**—Waelli describes the results of research on the biologic antiferment tests by the various technics in vogue. He obtained concordant results with all the methods in 71 per cent. of sixty-four applications of the tests, and he discusses the mechanism and nature of the reactions. In health there is no increase in the amount of antitrypsin in the blood-serum, with rare exceptions, but an increased antitrypsin content seems to be constant with cancer and with exophthalmic goiter, and it occasionally occurs with tuberculosis and other infectious diseases. Positive findings are therefore an aid to some extent in the diagnosis of cancer. On the other hand, a negative reaction to the Brieger test renders the existence of malignant disease highly improbable. He tabulates in conclusion the findings in 120 clinical cases. (The Brieger technic was described in THE JOURNAL, July 4, 1908, p. 83, but modifications proposed and experiences with the test have been published since, for example, 1909, liii, 1782; 1910, liv, 500; 1910, lv, 353, and 1911, lvi, 627.) Waelli used Mandelbaum's modification of the antitrypsin test, a milk-agar instead of the Loeffler plate. Mandelbaum mixes with each 0.1 c.c. of the blood-serum increasing amounts of a 1 per cent. aqueous solution of trypsin, increasing from 0.3, 0.4, 0.5 to 4.5. The mixtures are well shaken up and a loop from each is inoculated in turn on milk-agar plates (two parts agar with one part milk are heated to 100 C., cooled to 50 or 60 C., and poured into the dishes.) Instead of eating out a hole (the

Dellenbildung with the Brieger technic on the Loeffler plates), the digesting power of the trypsin solution is shown by the clearing up (*Aufhellung*) of the milk-agar around the spot inoculated.

Monatsschrift für Geburtshilfe und Gynäkologie, Berlin

August, XXXVI, No. 2, pp. 141-270

175 Technic for Treatment of Prolapse of Genital Organs. (Einige Bilder und Bemerkungen zur Erkennung der Beckenverschlussmittel vor und während der Prolapsoperation.) H. Sellheim.
176 Lipoid Content of the Placenta. B. Blenenfeld.
177 *Extraction of the Placenta by Hand. (Ueber manuelle Lösung der Placenta.) M. Rogoff.
178 Coagulation of the Blood. (Zur Blutgerinnungsfrage.) F Ebeler.
179 Coagulation of the Blood in Eclampsia. F. Ebeler and F. Engelmann.
180 Histologic Differentiation of Gonorrheal Salpingitis. J. W. Miller.

177. **Manual Extraction of the Placenta.**—Rogoff draws his conclusions from 973 cases of extraction of the placenta in the Moscow hospital from 1901 to 1911. He thinks the necessity for it arises generally from improper handling of the third stage by midwives. They should be instructed never to massage the abdomen or uterus after the birth of the child as it interferes with the normal contraction and relaxation of the uterus. Two hours is not too long to wait for delivery of the placenta. Interference should not be undertaken earlier unless there is indication for it; outward hemorrhage can be detected by observation and internal hemorrhage by the condition of the pulse. Before introducing the hand, Credé's method should always be tried. Sometimes the retention is caused by constriction at the contraction ring, and in such cases the placenta will be delivered spontaneously under chloroform anesthesia. The mortality in private deliveries is very high—higher than that of cesarean section or forceps delivery, on account of the extreme danger of infection, but in hospitals with extreme care to avoid infection it is moderate. In the Moscow hospital patients are given a douche of bichlorid, iodin or lysol solution immediately after the delivery of the placenta and afterward if the slightest abnormal odor appears in the discharge.

Münchener medizinische Wochenschrift

August 27, LIX, No. 35, pp. 1889-1936

181 Apparatus for Measuring Contamination of the Air in Rooms. (Ueber Luftuntersuchungen.) W. Weichardt and C. Kelber.
182 Biologic Importance of the Eosinophil Substance. (Zur Chemie der Zellgranula.) E. Petry.
183 *Bases for Serotherapy of Typhoid. (Grundlagen einer Serumtherapie des Typhus abdominalis.) R. Pfeiffer and G. Bessau.
184 Iodin Content of Human Ovaries. B. Zoeppritz.
185 Roentgenoscopy of Child Lung with Pleuritic Adhesions. (Die interlobare pleuritische Schwarte der kindlichen Lunge im Röntgenbild.) F. Eisler.
186 Advantages of Colloidal Tungsten in Place of Bismuth in Roentgen Work. (Kolloidale Wolfram als Ersatz für Wismut bei Röntgenaufnahmen des Magen- und Darmkanals.) R. Krüger.
187 *Serotherapy of Pregnancy Dermatosis. (Zur Serumbehandlung der Schwangerschaftsdermatosen.) F. Veiel.
188 *Familial Pseudoleukemia and Sarcoma with Inherited Tuberculous Taint. E. Braun.

183. **Serotherapy of Typhoid.**—Pfeiffer and Bessau conclude from the data at present on hand that the active therapeutic agent in all forms of serotherapy of typhoid is the specific bacteriolysin or lysins. The results achieved to date have been very modest, they say. It is possible, however, they admit, that the bacteriolysins might be so concentrated in the serum as to provide a suitable and effectual means of treating typhoid.

187. **Serotherapy of Pregnancy Dermatosis.**—Veiel reports a case of severe herpes gestationis in a woman of 36 at the eighth month of her sixth pregnancy. The inner and front sides of the thighs were covered with large vesicles and a serpiginous erythem developed on the trunk. The itching and nervous exhaustion were intense. A subcutaneous injection of 10 c.c. of the serum from a healthy pregnant woman near term was then made in the buttocks; the pruritus was somewhat modified the next day but recurred with its former intensity the following day. Then 20 c.c. of serum from the same donor was injected in the same way and the dermatitis was transformed in a few hours. By the next day there was scarcely any itching and no new vesicles had formed while the temperature was normal. The improvement persisted and a healthy child was normally delivered. The third day the temperature rose again and in a few hours a new crop of vesicles appeared on the thighs but they were small and there was little itching so that no further injection was given although an isolated vesicle developed occasionally during the following weeks before all traces of the dermatitis had entirely disappeared.

188. **Familial Malignant Lymphoma and Sarcoma.**—Braun relates that two brothers and a sister, all in the forties and residing in different German cities, developed malignant lymphoma, pseudoleukemia or sarcoma, all dying within six years. One was a physician, one an artist. There was a tuberculous taint evident in collateral branches of the family through four generations, but the parents were clinically free from it. The mother is still living in good health; the father died at 60 of heart disease. They had a common great-grandparent.

Therapeutische Monatshefte, Berlin

September, XXVI, No. 9, pp. 633-696

189 Suture of Blood-Vessels. (Die praktische Bedeutung der Gefässnaht.) Guleke.
190 *Intratracheal Insufflation for Artificial Respiration. (Meltzersche Insufflation bei Atemlähmung.) H. Stadler.
191 Laryngoscopy and Bronchoscopy. (Zur Bewertung der Autoskopie bei erschwerten Dekanülement und in diagnostisch unklaren Affektionen der unteren Luftwege.) Uffenorde.
192 *Sulphuric Acid Sterilization of Rubber Gloves. (Zur Frage der Sterilisation der Gummihandschühe.) C. Arnd and F. Rusca.
193 *Reform in Advertising Medicinal Articles. (Zur Arzneimittelliste des D. K. f. inn. Med.) C. Hirsch.

190. **Intratracheal Insufflation for Artificial Respiration.**—Stadler's patient was a tabetic, with severe crises at times, who developed primary paralysis of the respiration. There were no signs of motor paralysis, so a cerebral hemorrhage could not be incriminated. Artificial respiration by the usual means failed to restore the natural respiration by the end of half an hour, although the heart action was constantly good. Stadler then applied the Meltzer technic for insufflation of oxygen, and the aspect of the patient changed at once to that of health. Only the immovable chest showed that the man was not sleeping naturally. After two and a half hours, natural respiration suddenly started up and in a few minutes the patient became conscious again for the first time since the attack began. In a few hours he had entirely recovered and no signs of bronchial irritation developed later. Stadler urges the importance of the Meltzer technic as a means for artificial respiration, adding that an ordinary rubber bulb might be used when an oxygen tank was not at hand. Its chief efficacy is in case of asphyxia from spasm of the muscles of respiration.

192. **Sterilization of Rubber Gloves.**—Arnd and Rusca call attention to what they say is the most economical and efficient method of sterilizing rubber gloves without injuring them. The gloves are washed in running water and then dried after using. At evening they are placed in a 5 per thousand solution of sulphuric acid and left for ten or twelve hours, after which they are rinsed in salt solution and are then ready to use. They have been using this method for three years and are highly pleased with it.

193. **Reform in Advertising Medicinal Articles.**—Hirsch insists that the propaganda for reform should be supported by the public and the official authorities as the present methods of advertising are a constantly growing peril for the public health. Is it not humiliating for us, he remarks, to have our patients say that they wish to be treated with some new drug which they have read about in the newspapers! Even the most inveterate empiricist feels better when he knows the chemical composition, etc., of the drug he is using. Too often the "conclusions" in regard to the action of the new drug are based on a casual rather than a causal effect. He declares that any physician who gives a drug about which he knows nothing except what the advertisements say, is practicing rank quackery. Quackery, he continues, has three forces at work on its behalf, and one of these is the physician who does not keep up with the propaganda for

reform.—*Das Kurpfuschertum besitzt 3 wichtige "Zutreiber," 1) die Dummheit, 2) die Reklame, und 3) den Arzt der nichts gelernt hat.*

Therapie der Gegenwart, Berlin

September, LIII, No. 9, pp. 385-432

194 *Treatment of Enlarged Prostate. L. Casper.
195 *Differential Pressure Procedures in Treatment of Heart Disease. E. Albrecht. Commenced in No. 8.
196 Portable Apparatus to Generate Nascent Oxygen for Inhalation. (Ueber Inhalation von Sauerstoff.) P. Bergmann.
197 *Two-Route Method of Treating Mucosa. J. Wedeles.

194. **Treatment of Enlarged Prostate.**—Casper says that prostatectomy cannot be regarded otherwise than as a serious operation, and it should be undertaken only when it is strictly indicated and then only by the suprapubic route. He accepts as formal indications for it the persistence of painful tenesmus and dysuria rebellious to all treatment, and when catheterization is painful or impossible. When it is difficult to introduce the catheter there is always danger of the tip going astray. Recurring hemorrhage from the prostate is another indication for operative measures, as also recurring calculi when conditions impede proper crushing of the stones. Still another indication is an environment rendering aseptic catheterization impossible. On the other hand, prostatectomy should not be attempted with severe general nutritional disturbances, severe diabetes or extensive changes in the heart and kidneys, advanced arteriosclerosis or general chronic uroesepsis.

Differential Pressure in Treatment of Heart Disease.—Albrecht gives here summaries of a number of the cases of heart disease in which he has systematically applied differential pressure procedures to act on the blood content of the heart by the changes thus induced in the pressure in the lungs, as described recently in Abstract 105 on page 976. He declares in conclusion that this method of treatment is applicable when all others have failed or are contra-indicated, and that it acts on the heart more directly than any other method, while the application can be graduated with exact dosage. It does not supplant the other methods of treating heart disease, but usefully supplements them.

197. **Two-Route Method of Treating Processes on Mucosa.**—Wedeles was surprised one day when he had treated a conjunctivitis with calomel to find the lesion intensely aggravated the next day; he then discovered that the patient had been taking an iodid for some time. The two drugs had evidently combined in the focus and generated mercuric iodid. The irritating action soon subsided so there was no further trouble by the end of the week, but the case suggested that this two-route method of administering drugs might be utilized for a caustic action from a powerful mercury salt generated in a cancer or other focus by this means.

Virchows Archiv, Berlin

June, CCVIII, No. 3, pp. 321-476

198 Tumor of Kidney Pelvis. (Mischgeschwulst des Nierenbeckens.) W. Fischer and K. Murakami.
199 Experimental Research on Genesis of Atypical Proliferation of Epithelium. T. Mori.
200 Aberrant Epithelial Cells in Skin. (Schicksal abgesprengter Epithelkeime in der Haut eines fünfmonatigen Kindes.) C. Firket.
201 Histogenesis of Endothelioma in Meninges. J. Fick.
202 Chromatophoroma of the Skin. Ribbert.
203 Tumor of Spermatic Cord. (Ein Mischtumor des Samenstranges.) T. Naegeli.
204 Experimental Scorbutus. (Experimentelle Erzeugung der Möller-Barlowschen Krankheit und ihre endgültige Identifizierung mit dem klassischen Skorbut.) K. Hart.
205 Marrow of Long Bones in the Horse. (Zur Kenntnis des Markes der Röhrenknochen beim Pferde.) E. Ackerknecht.
206 Antagonistic Action of Thymus and Epinephrin-Producing System. (Ueber das Verhältnis des Thymus zum chromaffinen System, über die Elemente der inneren Sekretion des Thymus und über das Verhältnis des Thymus und des chromaffinen Systems zum Sympathikus.) J. Hornowski.
207 Focus of Pigmented Necrosis in Liver. (Fall von herdförmiger biliärer Lebernekrose.) A. Roccavilla.
208 Diabetes from Compression of Pancreas by Chronically Distended Large Intestine. (Zur Kenntnis des enterogenen Diabetes.) A. Brosch.
209 Syphilis of the Lung. (Zur Kenntnis der Lungensyphilis beim Erwachsenen, zugleich über sogenannte muskuläre Lungenzirrhose.) T. Tanaka.
210 Giant Cells Clustering Around Degenerated Fibers. (Bildung von Fremdkörper-Riesenzellen um degenerierte elastische Fasern.) H. Schum.
211 Vater-Pacini Bodies in Pancreas. (Vorkommen von Vater-Pacini'schen Körperchen am menschlichen Pankreas und über eine krankhafte Veränderung derselben.) W. Ceelen.
212 Alveolar Echinococcus Disease in Man. V. Mirolubow.
213 Xiphopagus Operated On Soon After Birth; Surviving Twin in Good Health at Age of 52. (Nachtrag zu der Mitteilung von Dr. Böhm über einen Fall von Xiphopagen, 1868.) H. Coenen.

Wiener klinische Wochenschrift

September 5, XXV, No. 36, pp. 1343-1374

214 Technic for Phimosis Operation. K. Büdinger.
215 *The Question of Bacillus Carriers. (Ueber Cholezystitis und Dauerausscheider und den heutigen Stand der Therapie.) E. E. Pribram.
216 Sacral Dermoids. J. Winkler.
217 Rupture of the Quadriceps Tendon. R. von Rauchenbichler.
218 *Acute Ascending Spinal Paralysis. (Zur Frage der Landryschen Paralyse—Poliomyelitis acutissima.) R. Blum.
219 Medical Inspection of Schools from the Standpoint of Nervous Disease. (Neuropathologen als Schulärzte.) L. Haskovec.

215. **The Question of Bacillus Carriers.**—Pribram reviews the measures that have been adopted to date to put an end to the elimination of typhoid bacilli after recovery from the disease, but states that the results have often been disappointing and the ultimate outcome in the cases in which vaccine therapy was applied has not been published, to his knowledge. Dehler and a number of others have removed the gall-bladder without other cause than to arrest the elimination of typhoid bacilli in the stools, and a number of cases have been reported in which the stools were permanently free thereafter from the bacilli. Pribram, however, gives the details here of a case in which the elimination of bacilli continued months and years after the gall-bladder had been removed for other reasons. There was no known history of typhoid in the case, but the woman in 1904 had resided in a house in which two persons were having typhoid. She had had two years previously attacks of gall-stone colic and she may have become infected with typhoid bacilli at that time or it is possible that she may have been infected first and may have been responsible for the two clinical cases. Her gall-bladder was removed in 1908 on account of the gall-stone trouble. In 1911 she complained of dragging pains in the abdomen and paratyphoid B bacilli were found in the stools but no typhoid bacilli. She has continued to void the paratyphoid bacilli ever since, unaffected by the most diverse therapeutic measures, including thorough courses of hexamethylenamin and chloroform. This case teaches the folly of removing the gall-bladder solely as a means to get rid of the bacilli, as they persist in this woman although she long has had no gall-bladder. Pribram urges that the public health service should keep track of bacillus carriers and if they cannot be cured arrangements should be made to segregate them and supply means of support for them—not in idleness but in work free from danger to the community. He cites the case of our American "Typhoid Mary" as "a brilliant instance of hygienic forethought and care on the part of the state."

218. **Acute Ascending Poliomyelitis.**—Blum reports two cases of the most acute form of Landry's paralysis. The first patient was an entirely healthy Vienna woman of 25 who spent five days at Berlin with her parents. A strong draft blew through the sleeper on her way to Berlin. On her return she found her legs so weak that she could not stand and she felt exhausted. By the next day there was total flaccid paralysis of the legs and the tendon reflexes were abolished but there was no pain and no tender points could be found and the patient's mind was clear. The next day the flaccid paralysis had extended to the arms and by the third day there was a slight rise in temperature. By the fourth day swallowing was difficult, the heart action rapid, respiration shallow and fast and signs of pneumonia became superposed on the typical Landry syndrome, the patient dying in stupor the ninth day. There was no reason to suspect syphilis; the Wassermann reaction was negative. The patient had not had a sore throat nor intestinal trouble, not even a coryza or any infectious disease. The other patient was a previously healthy young man; the syndrome came on with severe pains and the young man died the third day, the paralysis not having extended to the arms in this case. The mind was constantly clear, the pulse 80. The treatment applied in the first case was aspirin, quinin and hydrotherapeutic measures, but the changes in the pulse and respiration soon required stimulants. Digitalis, caffein and oxygen displayed only transient benefit.

Zeitschrift für Geburtshülfe und Gynäkologie, Stuttgart

LXXI, Nos. 1-2, pp. 1-448. J. Veit Festschrift. Last indexed September 14, p. 998

220 Sterilization of the Hands. (Kritik der Händedesinfektionsmethoden.) R. Schaeffer.
221 Is Eclampsia an Immunity Reaction? A. Bauereisen.
222 The Visible Blood-Vessels in the Female Bladder. (Zur Lehre von den kystoskopisch sichtbaren Blutgefässen der weiblichen Blase nebst Bemerkungen über die didaktische Verwendung derselben.) F. Fromme.
223 *Insufficiency of the Liver and Creatinin Metabolism During Pregnancy. (Zur Frage der Leberinsuffizienz und des Kreatininstoffwechsels während der Schwangerschaft und bei den Schwangerschaftstoxikosen.) T. Heynemann.
224 *Nitrogen, Phosphorus and Sulphur Metabolism During Pregnancy. (Untersuchungen über den Stoffwechsel von Stickstoff, Phosphor und Schwefel bei Schwangeren.) E. Landsberg.
225 Advantages of Opening and Spreading the Uterus in the Wertheim-Schauta Operation for Genital Prolapse; 110 Cases. W. Stoeckel.
226 *Embryonal Tissue Inclusions in Origin of Tumors. (Zur Kenntnis der normalen und abnormen embryonalen Gewebseinschlüsse und ihrer pathologischen Bedeutung.) R. Meyer.
227 *Hemostasis with Abdominal Hysterectomy for Cancer. (Blutstillung bei der abdominalen Karzinomoperation.) F. Fromme.
228 Transplanted Ovary Does Not Get Normal Blood-Supply. (Kann ein transplantiertes Ovarium sich ebensogut entwickeln wie ein in loco gebliebenes?) M. Kawasoye.
229 Biologic Tests of Pregnancy. (Ueber den Lipoidgehalt und die Kobrahämolyse aktivierende Fähigkeit des Serums Schwangerer und Nichtschwangerer.) R. Roemer.
230 Obstetrics in Private Practice. (Statistisches über 600 Geburten der Privatpraxis.) H. B. Semmelink.
231 *Determination of Calcium Content of Blood. (Der Kalkgehalt des menschlichen Blutes, besonders beim Weibe und eine praktisch-klinische Methode denselben quantitativ zu bestimmen.) A. J. M. Lamers.
232 Repeated Spontaneous Rupture of the Uterus. G. Becker.

223-4. **Alleged Insufficiency of the Liver in Pregnancy.**—Heynemann devotes over fifty pages to the report of his chemical research on the liver functioning and creatinin metabolism during pregnancy. He states that he found nothing to suggest any special typical injury of the liver from the existence of a pregnancy and nothing to suggest that the liver is especially involved in the production of eclampsia. Landsberg comes to practically the same conclusions, declaring that a pregnancy is a purely physiologic process, favorable rather than harmful for the woman's organism as a whole. He insists that the changes in the functioning of the organism should be regarded as physiologic, necessary and beautifully adapted to their purpose.

226. **Aberrant Embryonal Cells.**—Meyer recently exhibited a collection of 300 colored photographs of tumors originating in aberrant embryonal cells, and he here gives a catalogued account of them and expatiates on the processes involved. Thirty-six illustrations in the text explain the salient points.

227. **Hemostasis with Abdominal Hysterectomy for Cancer.**—The two cases reported by Fromme show that venous hemorrhage may occur at the close of an operation of the kind, rebellious to tamponing and impossible to control by ligation of the vessels owing to their being embedded in tough fascia tissue or because the hemorrhage issues from an opening in the sacrum. It is easy to control the hemorrhage, however, with two or three long clamps, the handles left protruding when the abdominal wound is sutured around them. The presence of the clamps did not disturb the healing process in the two cases reported; he advises not to remove the clamps for forty-eight hours.

231. **Determination of Calcium Content of the Blood.**—Lamers reviews recent research which is confirming more and more the importance of the calcium content of the blood as a factor in health and disease. He found the percentage low in the four women with eclampsia whom he has had opportunity to examine. Drennan called attention last year to the abstraction of calcium salts from the mother's blood by the fetus as a possible cause of eclampsia. Lamers' research on fourteen non-pregnant and thirteen pregnant women showed a higher calcium content in the pregnant. He has devised a reliable technic for quantitative determination of the calcium content of the blood: The blood is prevented from coagulating by addition of extract of leeches and the plasma is pipetted after centrifuging. The plasma is evaporated and burned to ash and this is dissolved with dilute hydrochloric acid and the resulting calcium chlorid filtered. The filtrate is rendered slightly alkaline with ammonium hydroxid, and then ammonium chlorid and acetic acid are added until there is a weak acid reaction. It is then heated to the boiling point and a few drops of ammonium oxalate are added and after a few minutes it is heated again and more drops of the oxalate added and the whole set aside in a warm place for four hours. The precipitate is then filtered and hot diluted sulphuric acid is poured on the precipitate in the filter until all the calcium oxalate has been transformed into calcium sulphate and oxalic acid, after which it is rinsed with hot water until no further sulphuric acid can be detected in it with barium chlorid. The oxalic acid in the filtrate is then quantitatively determined by titration. He uses for this a 1/50 normal solution of potassium permanganate until the fluid turns a permanent pink.

Zeitschrift für klinische Medizin, Berlin

LXXVI, Nos. 1-2, pp. 1-166. Last indexed August 31, p. 755

233 Atony of the Stomach. (Atonia ventriculi.) K. Faber.
234 Inclusions in Red Blood-Corpuscles After Splenectomy for Hemolytic Anemia. (Ueber merkwürdige Erythrozyteneinschlüsse bei einem Fall von Milzexstirpation.) O. Roth.
235 *Experimental Research on Autoserotherapy. G. Eisner.
236 Changes in Chlorid Content of Blood with Gastric Secretory Disturbances. (Aenderungen des Chlorgehalts im Blutserum bei Sekretionsstörungen des Magens.) W. Arnoldi.
237 *Tests of Pancreas Functioning. (Untersuchungen zur funktionellen Prüfung des Pankreas.) J. Wertheimer.
238 Favorable Influence of Meat Extractives on Utilization of Vegetable Foods. (Einfluss der Extraktivstoffe des Fleisches auf die Ausnützung vegetabilischer Nahrung.) H. Wolff.
239 Influence on Eosinophil Cells of Epinephrin, Pilocarpin and Physostigmin. (Ueber den Einfluss sympathiko- und autonomotroper Substanzen auf die eosinophilen Zellen.) G. Schwenker and H. Schlecht.
240 *Reduction of High Blood-Pressure by Dieting. (Diätetische Beeinflussung pathologischer Blutdruckstelgerungen.) V. Hecht.
241 The Blood-Picture with Endemic Goiter and Means to Influence It. (Ueber das Blutbild bei endemischem Kropf und seine Beeinflussbarkeit durch Schilddrüsen- und Joddarreichung. J. Bauer and J. Hinteregger.
242 *Two Cases of Fatal Yellow Atrophy of the Liver After Salvarsan. (Zur Frage der Leberveränderungen nach Salvarsan.) Severin and Heinrichsdorff.

235. **Autoserotherapy.**—Eisner has been trying on animals Gilbert's method of treating serofibrinous pleurisy, especially the tuberculous, by aspirating from 1 to 3 c.c. of the pleural effusion and reinjecting it into the subcutaneous tissue without withdrawing the needle. A reaction followed in every instance when the rabbit or guinea-pig was tuberculous. Leukocytosis regularly followed the injection also in all cases; this may explain the favorable results reported by many clinicians from this autoserotherapy.

237. **Tests of Pancreas Functioning.**—Wertheimer has been giving Ehrmann's palmin test a thorough trial (described in THE JOURNAL, Aug. 31, 1912, p. 755), and extols its simplicity and reliability. No other ferments occurring in the gastrointestinal canal can disturb the findings, and they can be utilized also for qualitative determination of pancreas secretion. The patient takes a palmin test breakfast: 30 gm. of rice flour are dissolved in 200 c.c. of water slightly salted and warmed. Then 75 gm. of liquefied palmin is stirred into the porridge and the stomach content is siphoned out two or two and one-half hours later. Some of the stomach content is thoroughly mixed in a reagent glass with a mixture of nine parts petroleum ether and one part benzol. The supernatant fluid is decanted and a 3 per cent. solution of copper acetate is added. If there are any free fat acids in the stomach content, they pass into the ether-benzol mixture and stain it green when the copper acetate solution is added. If the reaction is negative, the test should be repeated under addition of $NaHCO_3$. If the pancreas is working properly the result will be positive. If it persists negative, this can be explained only by functional incapacity of the pancreas or obstruction of its outlet. The experiences in a number of clinical cases are tabulated; in some a retention stomach tube was used which permitted instructive findings.

240. **Dietetic Treatment of Pathologic High Blood-Pressure**—Hecht states that regulation of the diet and physical and mental repose will soon bring down a pathologically high blood-pressure without fail, and in many cases reduce it to normal. The diet must be regulated to restrict intake of meat, fluids in general, alcohol, salt and condiments, while giving the prominent place to fresh vegetables, served with

the water in which they are cooked. He gives typical instances to show the benefit from these measures in fifteen cases of high blood-pressure with much corpulence, in eight of high blood-pressure with sclerosis of the kidney and albuminuria, and in eight without these. Appropriate regular gentle exercise is an important aid.

242. **Yellow Atrophy of the Liver Under Salvarsan.**—In one of the two fatal cases reported the changes in the liver did not become clinically manifest at a time to suggest their connection with the salvarsan. But this was evident in the second case, and in both the age of the changes in the liver coincided with the time since the salvarsan had been given, and in both arsenic was found in the organs and especially in the liver.

Zeitschrift für Urologie, Berlin

August, VI, No. 8, pp. 621-726

243 Cystopurin as a Disinfectant for the Urine. G. Krebs.
244 Diverticula in the Urethra. (Ueber Harnröhrendivertikel.) W. Denk.
245 Determination of Length of Individual Posterior Urethra. (Untersuchungen über die Länge der Pars posterior urethrae bei Urethritis und Urethroprostatitis.) H. Lohnstein.

Zentralblatt für Chirurgie, Leipsic

August 31, XXXIX, No. 35, pp. 1185-1216

246 *Improved Technic for Stasis Hyperemia. (Hyperämie oder Lymphstauung?) Gelinsky.
247 Chip from Scapula to Close Defect in Skull. (Zur Frage der Deckung von Schädeldefekten.) W. Röpke.

246. **Improved Technic for Hyperemia Treatment.**—Gelinsky's observation has convinced him that the benefit from Bier's therapeutic obstructive hyperemia can be obtained equally well by constriction too loose to arrest even the venous circulation. The best results are obtained when the constricting bandage induces merely an edematous swelling of the limb, without signs of hyperemia. The more superficial the inflammatory process, the smaller and leaner the limb, the looser effectual constriction can be applied. Erysipelatous processes respond most readily, while processes in the knee require maximal constriction. The inflammation spreads in the lymphatics and lymph spaces, so it is rational to assume that the constriction arresting the circulation of lymph is the main factor in the benefit from stasis hyperemia treatment, and that this alone suffices. The pain is arrested and no inconveniences follow this slight compression which does not require supervision. It is an important aid in warding off complications after machinery injuries of the hands requiring suturing of tendons, etc.; it is also valuable in prophylaxis after an emergency operation on a joint on the battlefield. For children and thin women, the elastic bandage need not be stretched at all; for robust men and very fat women it can be drawn out 0.5 cm. to each 10 cm. stretch. The soft rubber elastic bandage used is distributed over the entire upper arm from elbow to axilla but for the thigh it is wound in superposed layers. This modification of Bier's original technic for obstructive hyperemia permits its extensive use in general practice, and Gelinsky commends it to all as combining all the advantages of the original technic while avoiding all its drawbacks.

Zentralblatt für Gynäkologie, Leipsic

August 31, XXXVI, No. 35, pp. 1137-1176

248 Midwives and Puerperal Morbidity. (Einschränkung der inneren Untersuchung durch die Hebamme und ihr Einfluss auf die Morbidität des Wochenbettes.) D. Grünbaum.
249 *Calcium Content of Blood. (Der Kalkgehalt des menschlichen Blutes.) G. Linzenmeier.
250 Hypophysis Extracts. (Zur Wirkung der Hypophysenextrakte.) F. Lehmann.

249. **Calcium Content of the Blood.**—Linzenmeier calls attention to Lamers' method (described in Abstract 231 above), as a notable advance, expatiating on the importance of the calcium content as recent research seems to have demonstrated that the calcium metabolism is in the charge of the glands with an internal secretion, and that the ovary in particular has a predominant part in it. This makes it necessary for gynecologists to welcome a simple chemical test which will give an oversight of the subject of calcium metabolism. Linzenmeier, however, declares that the examination should be made of the whole blood, not of the plasma alone, as the blood-corpuscles may contain calcium. This renders the addition of the leech extract unnecessary and thus simplifies the technic. Linzenmeier advises further to use a little more blood than the 20 c.c.; with such a small amount the limits of error are too close.

Gazzetta degli Ospedali e delle Cliniche, Milan

August 27, XXXIII, No. 103, pp. 1073-1080

251 Semiflexed Attitude of the Leg as Sign of Appendicitis. (Il segno della gamba nell'appendicite.) L. Minervini.

August 29, No. 104, pp. 1081-1088

252 *Keeping Patient Under Influence of Narcotics in Treatment of Acute Meningitis; Two Cases. (A proposito di un tentativo terapeutico fortunato in due casi di meningite acuta.) T. Silvestri.

252. **Treatment of Acute Meningitis.**—Silvestri reports a favorable outcome in very severe epidemic meningitis in a girl of 15 and a young man whom he treated by keeping them constantly under the influence of bromids and calcium lactate supplemented by chloral and morphin, ice to the head and revulsion along the spine. This treatment was based on (1) his success with it in a case of puerperal mania, one of typhoid delirium and in two children with convulsions and high fever; the morphin was omitted for the children; (2) on Stroganoff's success with his prophylactic chloral treatment of eclampsia, and (3) on the research and experiences which have shown that inflammation is prevented or checked by arresting with an anesthetic the reflexes starting in the focus of inflammation. The calcium lactate was selected for its sedative action on the innervation of the vegetative system, its restoring action on the central nervous system, its harmlessness, its efficacy in treatment of convulsions in general, and its prophylactic action in respect to poisons causing contracture, and its property of arresting the production of effusions. The girl had four relapses of the meningitis in the five weeks before convalescence was complete. The young man rapidly recovered but was left with otitis media from which a diplococcus was cultivated.

Policlinico, Rome

August 25, XIX, No. 35, pp. 1261-1296

253 Pathology and Treatment of the Thymus. (Malattie del timo.) T. Pontano.

August, Medical Section, No. 8, pp. 335-382

254 Hemorrhagic Erosions of the Stomach with Cancer in the Pancreas or Cirrhosis of the Liver; Two Cases. G. Cappello.
255 Case of Congenital Heart Disease. (Recerche grafiche in un caso di malattia congenita e combinata del cuore.) C. Pezzi.

August, Surgical Section, No. 8, pp. 337-384

256 Pathogenesis of Traumatic Peritonitis Without Perforation of the Intestines. G. Frattin.
257 Hypophysis Tumors. (Struma ipofisario iperplastico con acromegalia e contributo alla patologia e chirurgia dei tumori ipofisari.) N. Leotta. Commenced in No. 7.

Riforma Medica, Naples

August 24, XXVIII, No. 34, pp. 925-952

258 Kala-Azar in Children. (Considerazioni spora 63 casi di anemia da Leishmania osservati nella Clinica pediatrica di Palermo.) R. Jemma.
259 *The Vaccinated and Revaccinated Among 2,979 Small-Pox Patients at Palermo 1911-1912. (L'immunita vaccinica dei vaiolosi e gli innesti immunizzanti practicati nei lazzaretti.) G. Pollaci.

259. **Small-Pox.**—Pollaci states that in the city and province of Palermo there have been 6,353 cases of small-pox since 1910, with 2,060 deaths. He cites the details of 2,979 cases at the two isolation hospitals in his charge. His data indicate that the protection from vaccination expires after five years. Vaccination in childhood is of little protection against contracting the disease in adult life, but it still has a marked attenuating influence on the small-pox. Fifty-four of the patients had been revaccinated, but the four deaths in this group were in patients with preexisting tuberculosis, syphilis or heart disease, with one exception.

Brazil-Medico, Rio de Janeiro

August 8, XXVI, No. 30, pp. 305-316

260 The Armadillo as the Host of Trypanosomes. (Sobre um trypanosomo do tatu, Tatusia novemcincta, transmittido pela Triatoma geniculata Latr. 1811. Possibilidade de ser o tatu um depositario do Trypanosoma Cruzi no mundo exterior.) C. Chagas.

Hospitalstidende, Copenhagen

September 11, LV, No. 37, pp. 1009-1032

261 Case of Pulsating Exophthalmos Cured by Ligation of Common Carotid. J. Ipsen.